West Plains Subarea Transportation Management Plan, Phase 1, US 2 Vicinity

Executive Summary

FEBRUARY 2022

WSDOT
Eastern Region Planning

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INTRODUCTION

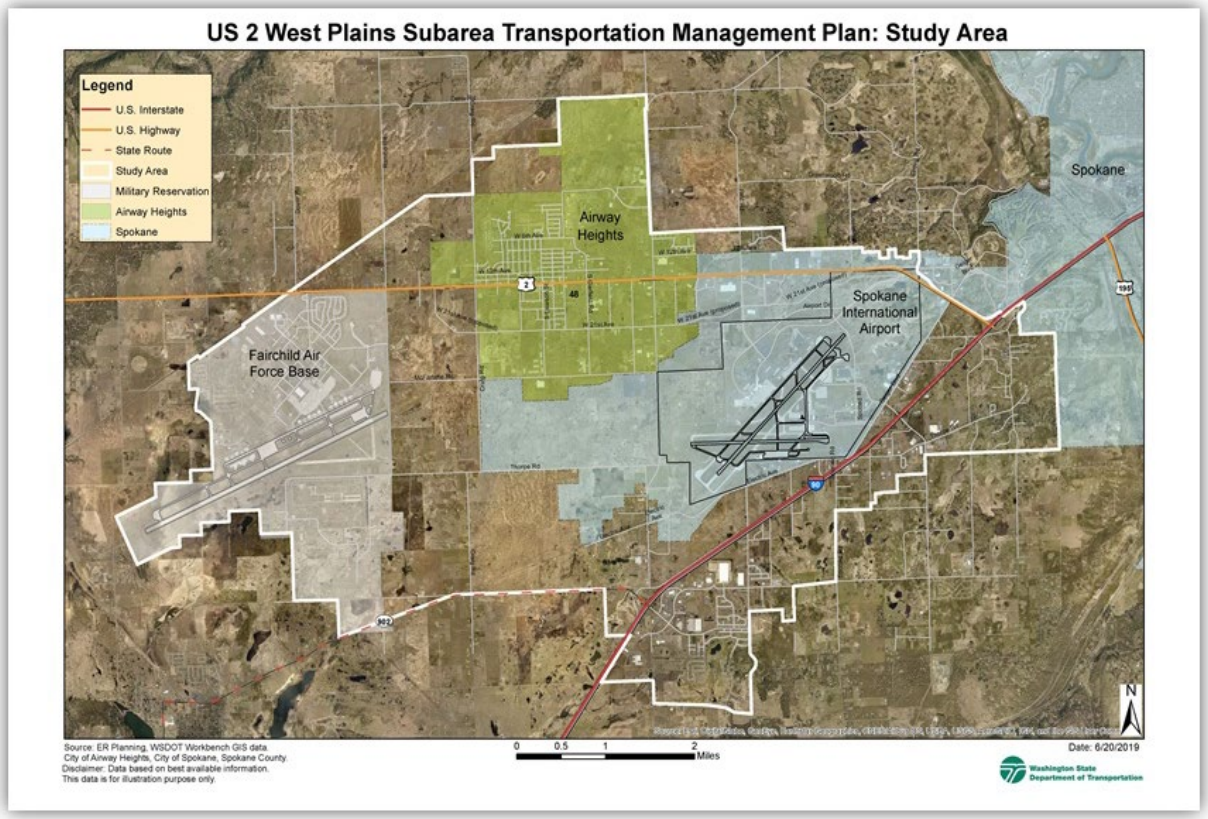
This document summarizes the study efforts for the West Plains Subarea Transportation Management Plan, Phase 1, US 2 Vicinity. The study's purpose is to develop multimodal practical solutions to mitigate increasing land use growth in the West Plains area of the Spokane region. The study was led by the Washington State Department of Transportation (WSDOT) Eastern Region Planning in coordination and collaboration with the jurisdictional partner agencies and respective community interests.

Study Area and Corridor

The project study area for which land use was analyzed and practical solutions considered encompasses the City of Airways Heights, the City of Spokane, and areas of unincorporated Spokane County along with Fairchild Air Force Base, Spokane International Airport (SIA), and lands of the Kalispel and Spokane Tribes. The study area is approximately described as being bounded by: Deno Road to the north, Mitchell Street to the west, Melville Road to the south, and Sunset Hill Frontage Road to the east.

The study primarily focused on a segment of the US 2 corridor extending from the Fairchild Air Force Base entrance at Michell Street to the west (approximately at MP 275.76) to easterly vicinity of Russell Road (approximately at MP 281.64). The length of the study corridor is approximately 6 miles in length.

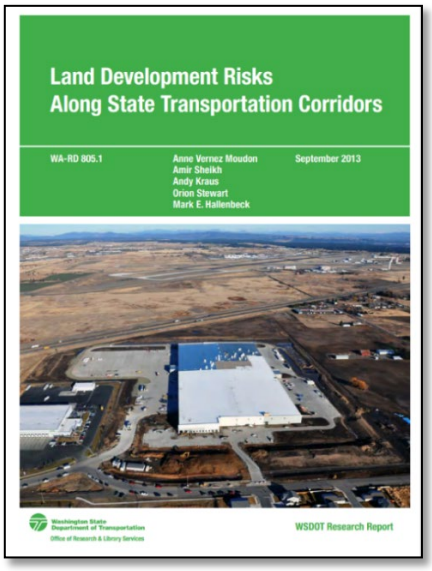
Figure 1 - Study Area and Corridor



West Plains Subarea Traffic Management Plan study area and corridor map

Plan Overview

The West Plains area was found to be one of the fastest growing areas in Washington State as defined in a final Research Report "Land Development Risks Along State Transportation Corridors". The research was led by the University of Washington in a collaborative joint effort with WSDOT and the Spokane Regional Transportation Council (SRTC). The research findings – primarily based on available land, utilities, and infrastructure – predicted steady rapid land use development in the West Plains by the forecast year of 2040.



Land Development Risks Along State Transportation Corridors research report cover

In the past few years, increasing local and tribal government land use planning and implementation of significant developments in the West Plains area confirmed the predicted steady rapid land use development was becoming a reality without the provision of a supporting multimodal transportation network to serve the various transportation needs. As a result of increasing actual and planned unsupported travel demands on primary corridors in the West Plains, WSDOT began the West Plains Subarea Transportation Management Plan (study) to provide a coordinated framework to concurrently develop and manage the multimodal system in a practical manner as development occurs.

The West Plains Subarea Transportation Management Plan (study) was initiated to address the following primary objectives:

- Refine previous planning studies and comprehensive plans into one study document,
- Evaluate current and future market land use and transportation conditions, and
- Propose multimodal "practical solution" strategies that will provide for the evolving transportation needs.

The subarea plan recognizes the need to study and identify a "practical" multimodal transportation network to keep up with the growing land use demand, particularly in and around US 2, and to collaboratively refine past study efforts and plan for "practical solutions" that can be prioritized and programmed.

Previous Studies

Over 18 studies by various jurisdictions and agencies have been completed in the West Plains area since 2006. This study refines previous studies by advancing their planned ideas into this study, refining terminuses of parallel networks such as $6^{th}/10^{th}/12^{th}$ and $18^{th}/21^{st}$ Avenues, and capturing insight from the public through various community engagement opportunities. The following subsections summarize the past plans/studies.

Timeline of Previous West Plains Area Studies

2006 – City of Airway Heights Highway 2 Revitalization
2009 – City of Spokane Master Bike Plan
2010 – Washington Airport & Compatible Land Use Guidebook
2010 – WSDOT US 2 Route Development Plan, Lincoln Co. Line to I-90 MP 266.86 to MP 283.01
2011 – SRTC West Plains-SIA Transportation Study
2011 – Spokane Tribe West Plains Development TIA
2012 – Spokane County Comprehensive Plan
2012 – Spokane AIR – West Site Transportation Analysis, City of Spokane
2013 – Land Development Risks along State Transportation Corridor, WSDOT
2013 – VE Study I-90/SR 902 I/C Improvements, Value Management Strategies
2014 – City of Spokane West Plains Subarea Transportation Plan
2014 – Spokane International Airport Master Plan
2015 – Rowand Business Park, Morrison Maierle, Inc.
2016 – City of Spokane Comprehensive Plan update 2017
2016 – City of Spokane Comprehensive Plan 2017 Appendix D
2017 – City of Airway Heights Transportation Circulation Plan
2017 – City of Airway Heights US 2 Plan Model Zoning Overlay
2018 – WSDOT Corridor Sketch Initiative, US 2: Craig Rd to Russell Rd, MP 277.2 to MP 281.5
2018 – Project Rose Traffic Impact Analysis

City of Airway Heights US 2 Corridor Plan (Downtown Revitalization Plan)

WSDOT has continually participated in the City of Airway Heights planning efforts in and around the downtown area. The City of Airway Heights Revitalization Plan proposes an "urban style" complete street roadway cross-section with median treatments, along with bicycle and pedestrian corridors along the study corridor. Notably, the revitalization plan also identifies potential zoning and land use changes that will support the proposed complete street transportation revisions.

As part of Airway Height's planning process, WSDOT committed to evaluating the proposed corridor changes along US 2 in a comprehensive manner while conducting the West Plains Subarea Transportation Plan study.

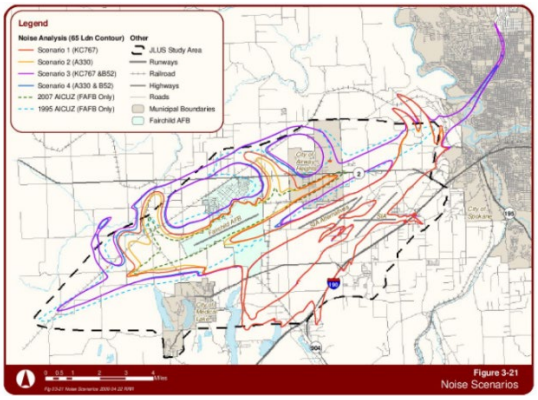
Following analysis and coordinated multimodal evaluation, the subarea plan's Practical Solutions Strategies and Circulation Plan study outcomes include the City of Airway Heights proposed revitalization complete street roadway section including median treatments and roadway channelization, along with provisions for bicycles and pedestrians in the downtown corridor area.

City of Airway Heights US 2 Corridor Plan cover

Fairchild Air Force Base – Joint Land-Use Study

The Fairchild Air Force Base Joint Land Use Study (JLUS) conducted by Spokane County was also reviewed. The JLUS is a community-based plan that builds consensus and obtains support from varied interests, including residents, property owners, local elected officials, business interests, the military, Native American Tribal governments and State and Federal agencies. **Figure 2** shows the final JLUS noise contour map that assess potential noise related to four future mission scenarios.

Figure 2 - Fairchild Air Force Base Joint Land Use Study Noise Contour Map



Fairchild Air Force Base noise couture map

Study Partners

The US 2 corridor spans approximately 6 miles and includes multiple jurisdictions and partner agencies. The study's partner agencies are:

- City of Spokane
- Fairchild Air Force Base
- Kalispel Tribe
- S3R3 Solutions (Public Development Authority)
- Spokane County
- Spokane International Airport
- Spokane Regional Transportation Council (SRTC)
- Spokane Transit
- Spokane Tribe
- West Plains Chamber of Commerce

Technical Advisory Team

A Technical Advisory Team (TAT), including professional staff from WSDOT and partner agencies, was convened for the study. With regular meetings, the TAT provided technical assistance and made key decisions, including the methodology for this study. All study milestones and phases were collaboratively developed and refined though the TAT.

Technical Advisory Team group picture

M2 WSDOT Headquarters Multidisciplinary Team

In addition to the TAT, WSDOT Eastern Region Planning also coordinated with the M2 Team at WSDOT Headquarters. The M2 Team is a multi-disciplinary panel of planners and engineers that provides guidance in region study efforts. The team reviews study methodology and follows the study's progress while providing guidance and technical support, particularly related to "practical solutions". WSDOT Eastern Region Planning presented study developments and received feedback from the M2 team on various occasions during the study process.

STUDY OBJECTIVES AND PROCESS

Focus Areas

The TAT established four focus areas for the study, which are shown in **Figure 3** and defined in the following subsections.

Safety

Evaluate and identify strategies to improve the safety performance for all modes of travel, such as adding strategic left-turn restrictions along the corridor.
(*Safety Pilot Project with HQ)

Mobility

Evaluate and identify strategies to improve the mobility for all modes of travel, such as developing a supporting roadway network, increasing transit service, improving the ability to walk and bike in and around the US 2 corridor.
(*Practical Solutions Workshops/Lab Pilot with HQ)

Quality of Life

Evaluate and identify strategies to enhance the quality of life in the West Plains area.

Economic Vitality

Evaluate and identify strategies to enhance economic vitality on the West Plains subarea.

Figure 3 - Study Focus Areas

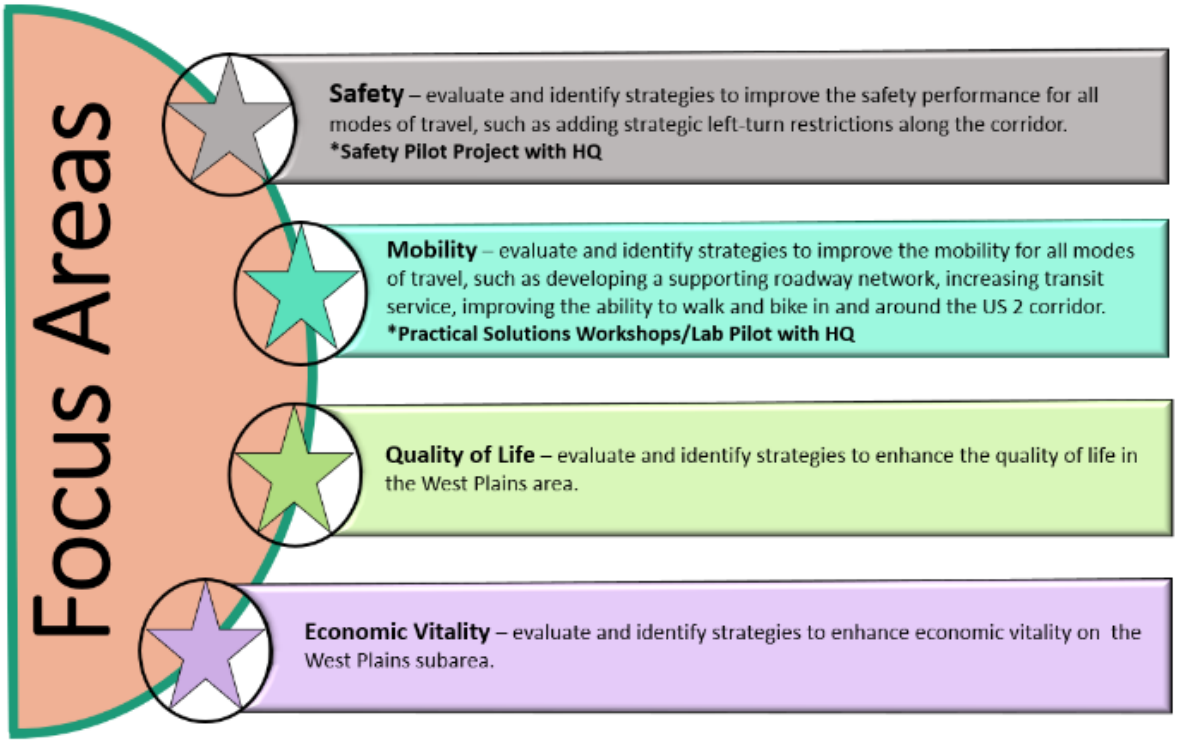


Image showing the four focus areas of the study that include safety, mobility, quality of life and economic vitality

Environmental Justice Assessment

An environmental justice (EJ) assessment was completed using US Census Bureau American Community Survey data from 2012-2016 to determine the socio-demographic profile of the study area, which is summarized in **Table 1**. The following demographics were evaluated:

- Population over 65 years of age
- African American Population
- American Indian Population
- Asian Population
- Poverty Population
- Minority Population
- Hawaiian Native Population
- Other Race Population
- Two or More Races Population
- Absolute Population
- Population Density
- Veteran Status Population

Table 1 - Study Area Socio-Demographic Profile Summary

Metric	Value
Total Population	13,550
Study Area Population Density	371/sq. mi.
Highest Population Density*	1,365/sq. mi.

Population	% of Total Population* (study area / high)
65+ years of age	9.7% / 24%
Below Poverty	11% / 24%
Minority Population	25.6% / 39%
Hispanic Non-White	7.4% / 13.7%
African American	4.9% / 16%
American Indian	2.5% / 19%
Asian	2.7% / 6%
Hawaiian Native	0.3% / 1%
Other Race	2.1% / 6%
2+ Races	5.7% / 13%
Veteran	11.5% / 33%

* By study area block group

Methods and Assumptions

One of the first tasks of the TAT was to develop the Methods and Assumptions document, which addressed the following:

- What are we striving to fix, address, and/or prevent?
- What is the study approach?
- What do we currently know about Phase 1 US 2 Vicinity?
- What are the targeted outcomes for the study?
- What are the anticipated study deliverables?
- What are the guiding principles for the study?
- What would success look like for partnering jurisdictions transportation needs in and around the West Plains.

The document discusses the study description, the study boundary area, the purpose of the study and how it will be conducted, what is already known, current conditions, previously proposed strategies, and the formation of the TAT. The Methods and Assumptions document is available in the Appendix.

Guiding Principles

During initial collaboration with multi-jurisdictional partners, the following "Guiding Principles" for the study were identified:

- The study will review previously proposed identified and emerging solutions and explore "Practical Solutions" to mitigate the identified issues.
- Local agency partners, the Spokane Tribe, the Kalispel Tribe, Spokane Transit Authority, Spokane International Airport,

Fairchild Air Force Base, and the Spokane Regional Transportation Council will collaborate in all phases of the study. The partners will collaboratively review past studies, past Intersection for Approvals, the County Urban Growth Area (UGA), zoning codes, comprehensive plans, corridor sketch, and other documents pertaining to the West Plains.

- Community engagement will be inclusive and transparent. We will involve a wide array of perspectives, disciplines, and backgrounds in our outreach and decision making.
- Quantitative analysis will be used to confirm issues and advance potential solutions.

Targeted Outcomes

One of the most important elements of the Methods and Assumptions document is the list of targeted outcomes for the study, which are:

- Develop a plan to address transportation needs that are based on land use growth projections, and includes a prioritized list of strategies and funding options
- Identify local network improvements that will support US 2 mobility, including parallel corridor such as 6th /10th/12th Ave and the 18th/21st Ave. Determine the local alignments and connections to the transportation system.
- Identify achievable "practical solutions" system improvements, including on and off the state network prioritization, future programming and implementation.
- Select strategies that promote predictable and reliable travel and response times for emergency services and Fairchild Air Force Base.
- Identify potential right of way needs.
- Analyze the impacts of land use development in the West Plains to US 2 and the regional network.
- Review previous West Plains study outcomes to identify opportunities to further advance and/or adjust as needed to align with current goals and performance needs.

Identifying "Success"

The Technical Advisory Team (TAT) was asked at the beginning of the study: "What would success look like for partnering jurisdictions transportation needs in and around the West Plains?"

During initial collaboration with the study partners, the following "Guidelines for Success" were identified (**bold** text designates areas of highest importance as selected by the TAT):

- **Buy-in from local jurisdictions to support the outcome, being mindful of limited funding opportunities.**
- **Maintaining Fairchild response time.**
- **Quality of life improvements and Pedestrian and Multimodal Safety.**
- **Plan ahead of land use changes.**
- **Maintain reliability for trucking, freight and commercial uses along the corridor.**
- **Reliable alternate routes to serve regional and local travel.**
- **Support the downtown plan of Airway Heights.**
- Funding for maintenance and operations is achievable.
- Actionable solutions.
- Achievable practical outcomes/list of actionable solutions.

- Supports local agency land use plans, future trips and business development.
- Promotes active transportation options.
- Accommodate expected development.
- Concur with local and tribal plans.
- Consider the needs of the business community.
- Understanding of possible limits to growth due to funding constraints addressing network failures.
- Make sure that the process is inviting, open and available to everyone being engaged in the process.
- Memorandum of Understanding (MOU), supporting coordination and partnerships between all parties.
- Modes perform above or at expectation.
- Solution to match the problem (on the same scale).
- Solving congestion/mobility challenges on US 2.

A copy of the Purpose and Need document is available in the Appendix.

Washington State Department of Transportation

West Plains Sub-Area Management Plan – Phase I, US 2 Vicinity
"Purpose and Need"

What are we striving to fix/address/prevent?

Land use development in the West plains vicinity is outpacing the available multi-modal transportation system in the area. Previous studies have indicated performance concerns (congestion) for the US 2 corridor in the Airway Heights area. There is a need, particularly in and around US 2, to collaboratively refine past study efforts and plan for potential "practical solutions" that can be jointly prioritized and programmed.

What is the study approach?

"Practical Solutions" is a WSDOT performance-based approach to transportation decision-making. This data-driven approach uses tools such as Transportation Systems Management and Operations (TSMO) solutions and performance measures to seek lower-cost approaches and efficiencies in addressing mobility gaps along US 2. This study effort will further refine and align past studies through the lens of "Practical Solutions".

Community engagement is another important key factor in helping to develop Practical Solutions. Practical Solutions are found when stakeholders work together to identify approaches that are sustainable and innovative. The community and other potential affected interests will be engaged throughout the study.

The US 2 West Plains Sub-area Management Plan Phase 1, refines previous studies that have been completed in the West Plains area. This study addresses the mobility gaps (congestion) that have previously been determined, on US 2 between the US 2/ I 90 interchange and Fairchild Air Force Base entrance as well as looking at other possible parallel frontage road connections for 6th/12th and 18th/21st to help alleviate traffic loading directly onto the US 2 corridor.

During this study, a team involving local agency partners, tribes, Spokane Regional Transportation Council, Spokane Transit Authority, WSDOT (Eastern Region/Headquarters), and other stakeholders will review and explore the following:

- The current operation and function of the corridor segment
- The evolving development changes and resulting future corridor operation and function
- Features of the corridor that have been previously identified as "working well" and the "opportunities to improve" in and around the corridor.

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Image of the front cover of Purpose and Need document

EXISTING CONDITIONS AND NEEDS

Throughout the study we looked to identify the possible factors contributing to the current transportation conditions surrounding the US 2 corridor and found:

- A lack of a local street network, which contributes to more travelers using US 2.
- A lack of multimodal (transit, bicycles, and pedestrians) transportation options, which can increase travel times and the dependency on personal vehicle trips.
- Census data that indicates 95% of people who work in the West Plains area live in areas outside of the West Plains
- Increased growth and development in West Plains is a regional priority.

Vehicular Travel

The US 2 study corridor is a four-lane principal arterial with a two-way center left turn lane. **Table 2** documents the existing intersections and their traffic control that were considered during the study. The following subsections document the vehicular travel data that was obtained to analyze travel conditions.

Traffic Counts

Traffic count data were collected during January, February, and May of 2019 for the AM and PM peak periods using Miovison cameras provided through collaboration of study partners to capture turning movement counts at key intersections. The AM and PM peak hours were determined from the traffic counts to be 7:00 am to 8:00 am in the AM and 4:15 pm to 5:15 pm in the PM along the corridor.

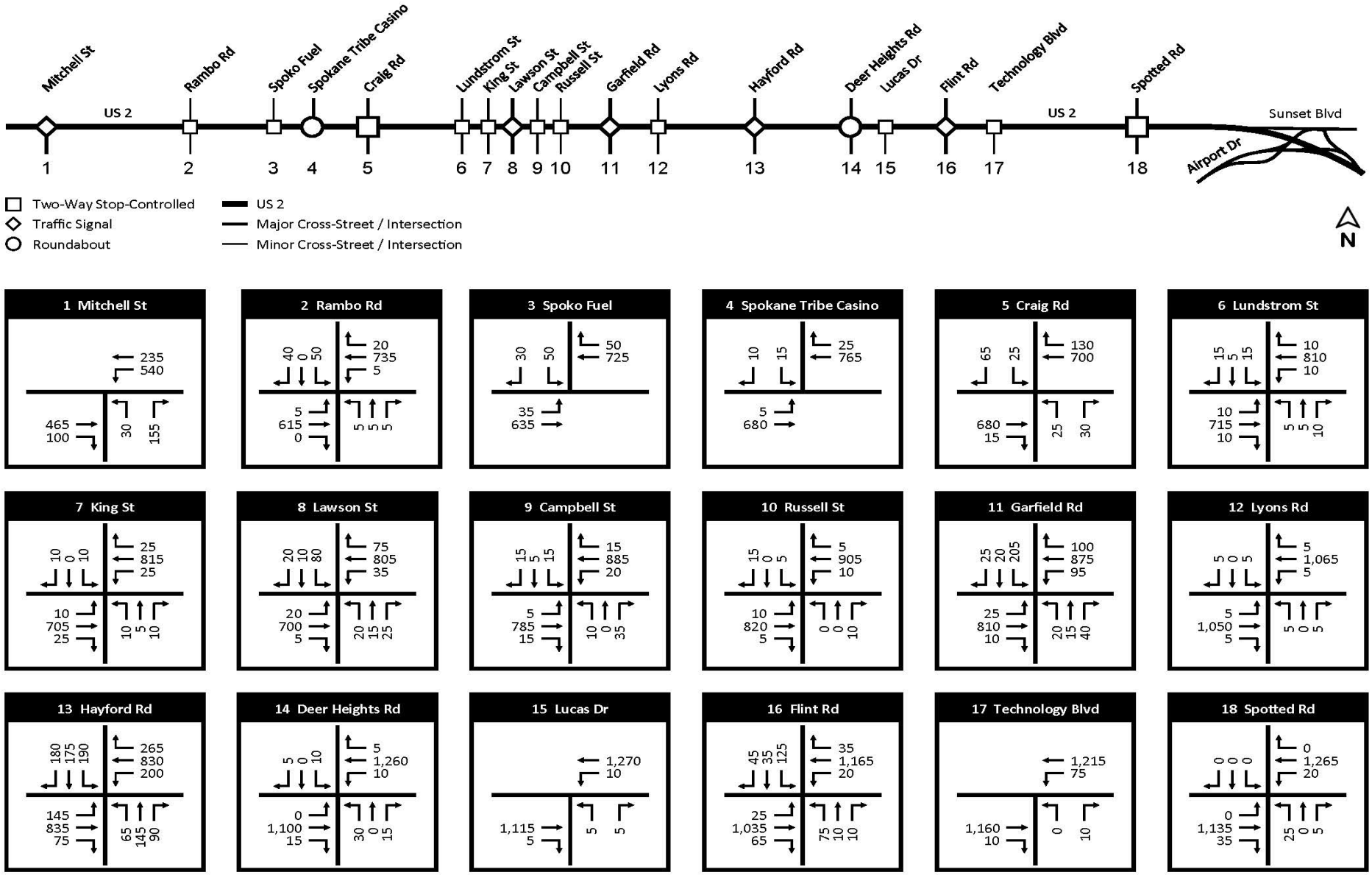
Table 2 - Existing Study Intersections

Intersection	Traffic Control
Mitchell Street (Fairchild Air Force Base entry) / US 2	Signal
Rambo Road / US 2	Two-Way Stop
Spoko Fuel Access Road / US 2	Two-Way Stop
Spokane Tribe Casino Access Road / US 2	Roundabout
Craig Road / US 2	Two-Way Stop
Lundstrom Street / US 2	Two-Way Stop
King Street / US 2	Two-Way Stop
Lawson Street / US 2	Signal
Campbell Street / US 2	Two-Way Stop
Russell Street / US 2	Two-Way Stop
Garfield Road / US 2	Signal
Lyons Road / US 2 (South side of Intersection only)	Two-Way Stop
Hayford Road / US 2	Signal
Deer Heights Road / US 2	Roundabout
Lucas Drive / US 2	Two-Way Stop
Flint Road / US 2	Signal
Technology Boulevard	Two-Way Stop
Spotted Road / US 2	Two-Way Stop
Sunset Frontage Road / US 2	Two-Way Stop
Russell Road / US 2	Two-Way Stop

Collected AM and PM peak hour traffic counts were balanced between intersections and operations analyzed to serve as a baseline for future 2040 conditions. **Figures 4 and 5** (AM and PM) document the collected counts.

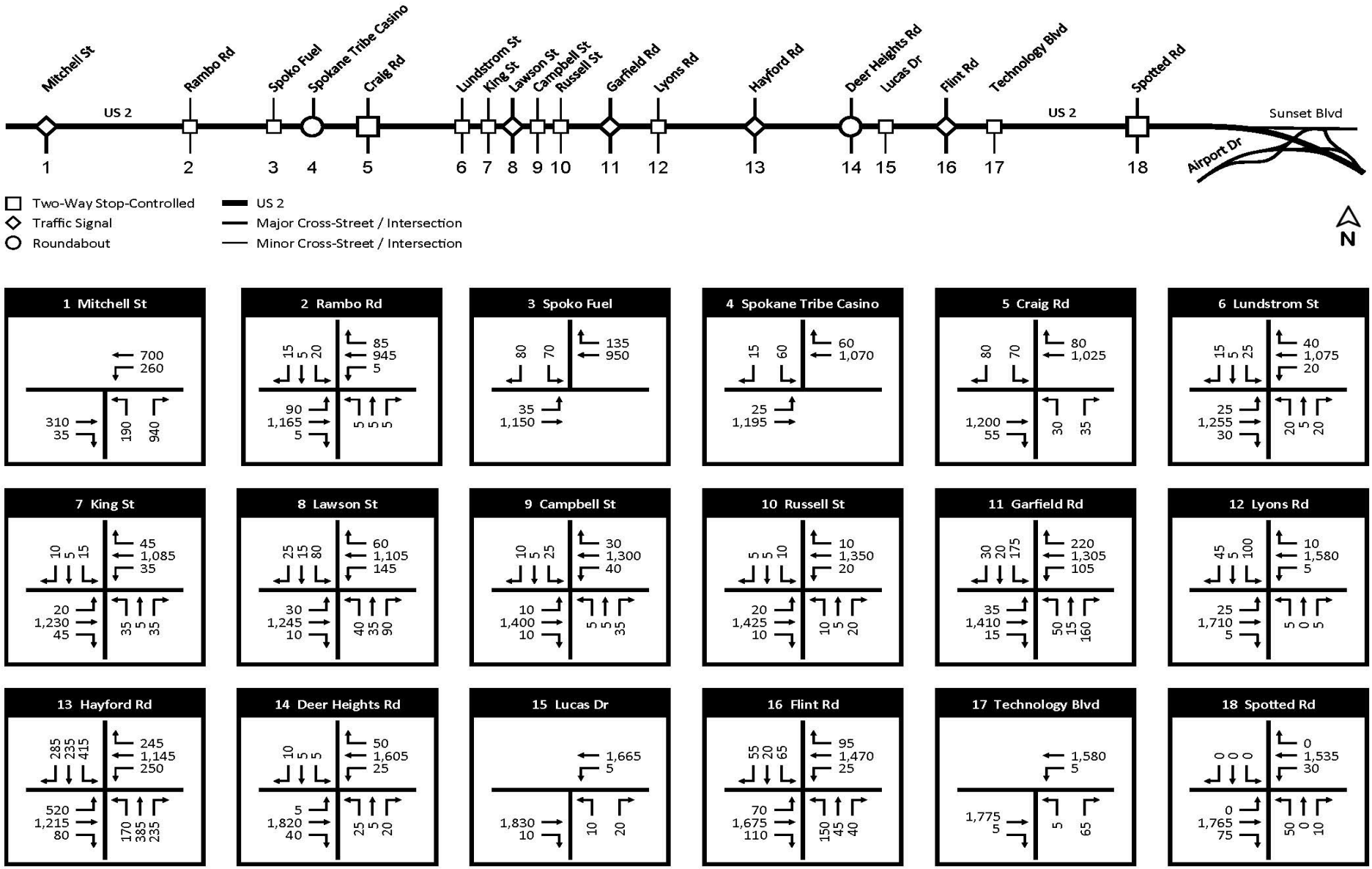
Snapshot from and picture of a Miovision camera recording traffic at US 2 and Garfield Rd

Figure 4 - US 2 Existing (2019) Balanced Intersection Turning Movement Volumes - AM Peak Hour



Graphic of 2019 AM peak hour (7:00 am to 8:00 am) balanced intersection turning movement volumes

Figure 5 - US 2 Existing (2019) Balanced Intersection Turning Movement Volumes - PM Peak Hour



Graphic of 2019 PM peak hour (4:15 pm to 5:15 pm) balanced intersection turning movement volumes

Existing Corridor Travel Time

Travel time (the amount of time it takes to travel from one end of the study corridor to the other, in each direction) was evaluated in the study as an indicator to compare existing and future operations along the US 2 study corridor and to identify desire for trips to travel on alternate routes. The existing (year 2021) average travel times were determined by driving the corridor, multiple times, during the AM and PM peak hours using the Federal Highway Administration (FHWA) random floating car method – a typical travel time methodology.

Using the floating car method, the average existing travel time for westbound traffic along the approximately 6-mile study corridor (Spotted Road to Mitchell Street) was 10 minutes in both the AM (7:00 am to 8:00 am) and PM (4:15 pm to 5:15 pm) peak hours. The average existing travel time for eastbound traffic (Mitchell Street to Spotted Road) was 9 minutes in the AM peak hour and 10 minutes in the PM peak hour.

Existing travel times were compared with estimated future travel times, which is provided in the Future Conditions section and **Figure 14**.

Origin-Destination Data

In addition to the traditional data collection metrics described in the previous subsections, WSDOT used data that compiles person trip counts between predefined geographic zones (origin-destination data) to better understand existing travel patterns, behavior, and distribution in the West Plains area. The study analyzed origin-destination trip data provided by StreetLight, a transportation data analytics company. The origin-destination data includes anonymous cellphone data recorded by smartphone tracking technology when a user has a location-based services application enabled and consents to sharing their movement data. A trip identified from this data is considered to end when the cellphone is stationary for at least five consecutive minutes. Trips via all modes are recorded including people driving, riding in a car, walking, bicycling, riding a bus, or traveling by other means.

Origin-destination data was obtained for 17 zones in the study area, which are consistent with the Traffic Analysis Zones (TAZs) defined in the Spokane Regional Transportation Council (SRTC) travel demand model, which is used to forecast future traffic demand.

Conceptual map of origin-destination gates in the study area (Source: StreetLight)

The origin-destination trip data provided the following insights:

- Traffic distribution for all TAZs within the land use study area
- Traffic distribution for special land uses (e.g. Airport) within the land use study area
- Internal/External traffic pattern for the West Plains land use study area
- Traffic pattern for major intersections within the land use study area

Some of the sample questions the dataset was used to provide answers to include:

- How much traffic uses Sunset Highway vs. I-90 to enter the West Plains?
- Where does traffic to Fairchild Air Force Base come from?
- What is the proportion of internal traffic vs. external traffic for the West Plains?
- What is the Impact of traffic to/from the West Plains on the I-90 corridor?

The results from the origin-destination analysis were manually validated against Highway Performance Monitoring System (HPMS) tube counts and the collected Miovision counts within the study area. The validation process showed that calibrated origin-destination volumes were reasonably close to both HPMS tube counts and Miovision counts.

Multimodal Systems

The West Plains communities, with significant low-income populations, is reliant on public transportation and non-motorized travel. However, the area currently offers limited multi-use paths, carpooling, or alternative modes such as rental bicycles, etc.

Bicycle and Pedestrian Networks

Bicycle facilities are limited in the study area, with portions of a shared use path in place along the north side of US 2 between Garfield Road and Deer Heights Road and traditional bike lanes striped on Hayford Road between US 2 and Northern Quest Drive. Shoulders are available along US 2; however, traffic volumes and speeds make the use of these uncomfortable for most bicyclists.

The shared use paths along US 2 also provide pedestrian connectivity. Other sections of the study corridor provide a combination of attached and detached sidewalks; however, gaps remain.

The Safe Routes to School Program is a federally funded reimbursement program that promotes walking and bicycling to school through improving infrastructure (such as addressing the missing gaps in sidewalks, lack of identified crossings, etc.), enforcement, safety, and education. Currently, there is one elementary school within the study area: Sunset Elementary located at 12824 W 12th Ave in Airway Heights. **Figure 6** illustrates the Safe Routes to School map for the school, which was provided by T-O Engineers.

Figure 6 - Sunset Elementary's Safe Routes to School

Aerial map showing the Sunset Elementary "Safe Routes to School" map by T-O Engineers

Public Transit

The Spokane Transit Authority (STA) is the regional public transit provider that serves the study area. STA provides a total of seven fixed-routes that serve/traverse the study area, as well as paratransit demand-response service. Some of these routes access the new West

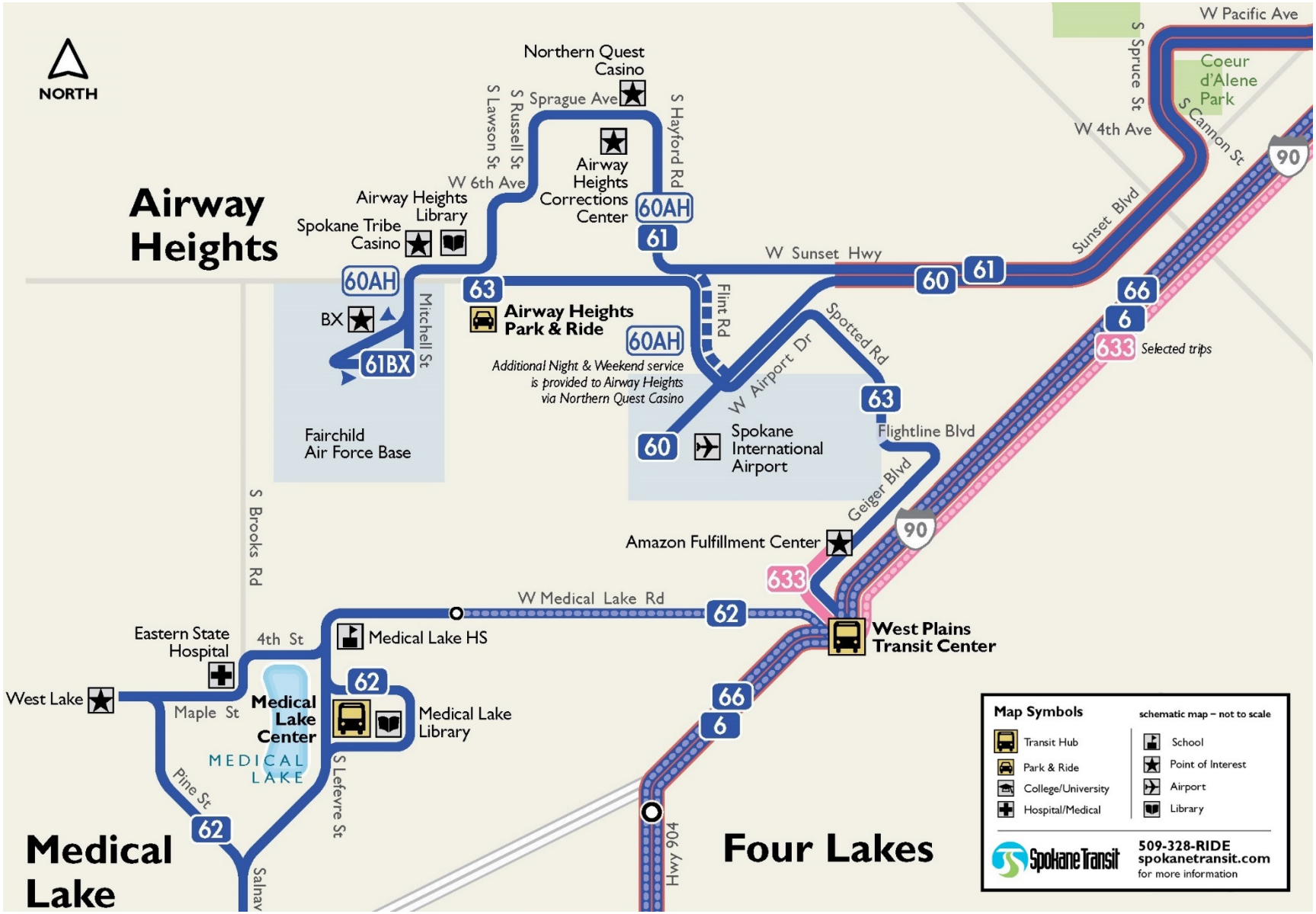
Plains Transit Center, which is located to the east of the I-90 / SR 902 interchange. STA provided boarding and alighting data and bus stop locations to assist in the existing conditions and safety analysis for the study.

The following summarizes the seven fixed-route bus services within the study area. **Figure 7** provides a map of these services. STA also has plans for a high performance transit (HPT) line that is planned for implementation by 2040, but no detailed planning or design has been conducted for this line and it is not currently funded.

- Route 60 provides service to the Spokane International Airport via Browne's Edition. This route begins/ends at the STA Plaza in downtown Spokane and provides service to Airway Heights traveling to the Spokane International Airport, Northern Quest Casino, Airway Heights Correctional Facility, and the Spokane Tribe Casino.
- Route 61 provides service along US 2 to Fairchild Air Force Base via Browne's Edition. This route begins/ends at the STA Plaza in downtown Spokane and provides service to Airway Heights along US 2 to Hayford Road, then north to Northern Quest Casino and the Airway Heights Correctional Facility, then returning to US 2 to serve the Spokane Tribal Casino and into Fairchild Air Force Base.
- Route 62 provides service to the City of Medical Lake from downtown Spokane, with a stop at the West Plains Transit Center.
- Route 63 a new route provides service form the new West Plains Transit Center to downtown Airway Heights. This route begins/ends at the West Plains Transit Center and provides service west along Geiger Blvd., north along Spotted Road, a loop that access the Spokane International Airport, north along Flint Road to US 2, west along US 2 to Hayford Road intersecting with Routes 60/61, and then to Lundstrom Street.
- Routes 6 and 66 provides service between downtown Spokane and the City of Cheney, with a stop at the West Plains Transit Center.
- Route 633 solely provides service between the West Plains Transit Center and the new Amazon distribution center.

Bus routes 60 and 61 currently operate every half hour on weekdays. Service on these routes is available less often nights and weekends. Routes 62 and 63 generally operate every hour, with some increased service during peak hours. Routes 6 generally operates every half hour on weekdays and Saturdays, with some increased service during weekday peak hours and reduced service during evenings and on Sundays. Route 66 only operates on weekdays, typically with half hour service and no service during the evenings. Route 633 operates all days of the week but on a unique and limited schedule tailored to the Amazon distribution center.

Figure 7 - Study Area Fixed-Route Transit Services



Map of fixed-route transit services in the West Plains (Source: STA)

Crash Analysis

An engineering crash analysis was conducted for the US 2 study corridor to assess its safety performance. The most current five years, at the time of the study, of WSDOT crash data (2015 to 2019) for US 2 between Mitchell Street/Fairchild Air Force Base and the US 2/I-90 interchange were used. The data contained a total of 543 crashes, which is broken down by crash severity in **Table 3**.

Table 3 - Number of Crashes by Severity

Crash Severity	Number of Crashes
Fatal Crashes	4
Suspected Serious Injury Crashes	8
Suspected Minor Injury Crashes	40
Possible injury Crashes	116
Property Damage Only Crashes	375
Total Crashes	**543**

Crash Analysis Process

Initially, all crash data were mapped to visualize the crash trends along the US 2 study corridor. To better align with WSDOT-wide safety study guidelines, the analysis focused on fatal and suspected serious injury crash for motor vehicle involved crashes, as well as all crashes involving bicycles and/or pedestrians. It is worth noting this segment does not appear in the statewide priority list for crash analysis locations (CAL), crash analysis corridors (CAC), or intersection analysis location (IAL); therefore, this segment of the US 2 corridor is not a high-priority statewide crash location. However, this does not diminish the need to develop strategies aimed at reducing fatal and serious injury crashes for all modes that may be important at the regional and local levels as strategies are developed to address other performance areas.

It is also worth noting that over the five years of crash data analyzed, there has been substantial land use growth surrounding the corridor and several projects along the corridor have been implemented including the Spokane Tribe Casino roundabout, Craig Rd intersection turning movement restriction with center median, Deer Heights Rd roundabout, and channelization between Hayford Rd and Deer Heights Rd to cite a few. The projects and land use growth resulted in significant changes in travel along the corridor, which limited the ability to use customary safety analysis tools such as the AASHTO Highway Safety Manual Predictive Method. Instead, crashes were reviewed individually to assess contributing factors, which were then compared with completed or anticipated projects along the corridor to evaluate each project's likely effect on the five-year crash data reviewed. Tables of the reviewed fatal, serious injury, and bicycle/pedestrian crashes were created to perform this assessment and contains the following information:

- Location
- ARM Value (miles)
- Collision ID
- Crash Milepost
- Crash Severity
- Crash Type
- Contributing Circumstance
- Impairment
- Time of Day
- Year Crash
- Improvement Milepost Approximated
- Improvement type/Completion year
- Weather
- Improvement Date
- First Impact
- Compass Direction

- Number Transit Stop Within 400ft./1000 ft.
- Junction Relation
- Expected Mitigation Outcomes from Planned Improvement
- Law Enforcement Traffic Collision data

Descriptive diagrams of the crashes were also created with a summary table of the crash conditions and a brief description of past and planned projects at each crash location. These data were internally used for the engineering analysis and review.

Crash Analysis Findings

The findings of the analysis were broken into two parts: all fatal and serious injury crashes and all crashes involving bicyclists and/or pedestrians.

Fatal and Serious Injury Crashes

Over the five-year period, there were four (4) fatal and eight (8) suspected serious injury motor vehicle involved crashes. Driver or pedestrian behavior was a contributing factor in nine (9) of these crashes. Five (5) of the crashes were intersection-related and occurred at the following locations along US 2:

- Rambo Road
- Craig Road
- Hayford Road
- Flint Road
- east of West Sunset Frontage Road

The remaining seven (7) fatal or serious injury non-intersection crashes were mainly isolated crashes. However, two of these crashes occurred between Campus Drive and Spotted Road (one fatal crash and one suspected serious injury crash) where a vehicle that was going straight hit a pedestrian that was crossing at a non-crosswalk location.

Two projects along the corridor are expected to mitigate the likelihood of opposite direction mid-block crashes:

- US 2/Craig Road channelization, which restricts left turns from US 2 to Craig Road and through movements from Craig Rd across US 2, and
- Channelization along US 2 between Hayford Road and Hazelwood Rd with a pedestrian crossing refuge at Hazelwood Rd.

Additionally, the new roundabout at US 2/Deer Heights helps reduce vehicular travel speeds along US 2 and provides crosswalks and median refuges to help facilitate crossing at locations with lower operating speeds through the intersection for bicyclist and pedestrians.

Bicycle/Pedestrian Involved Crashes

Over the five-year period, bicycles/pedestrians were involved in three (3) fatal, two (2) serious injury, six (6) minor injury, one (1) possible injury, and one (1) property damage only crashes. There were no bicycle/pedestrian-involved fatal or serious injury crashes at intersections on the corridor. As noted previously, one fatal crash and one suspected serious injury crash both occurred between Campus Drive and Spotted Road, with both involving a vehicle going straight and hitting a pedestrian crossing US 2 at a non-crosswalk mid-block location. All bicycle/pedestrian-involved fatal and serious injury crashes had bicyclist/pedestrian behavior as a contributing factor and in one crash the driver was under the influence of alcohol.

The new channelization along US 2 between Hayford Road and Hazelwood Road with a pedestrian crossing refuge at Hazelwood Road is anticipated to reduce the likelihood of mid-block crashes with pedestrians near the location.

Commute Patterns

Data from the 2017 US Census Bureau "On the Map" online mapping tool, which provides geospatial information on where people work and live, was used to gain an understanding of commute patterns in the study area. The data reported that approximately 2,440 people work in the study area with 95% being people who do not live in the study area. Meanwhile, approximately 1,500 people live in the study area but work elsewhere. Each day workers commute to and from the area, adding to the congestion along US 2. Only approximately 120 people both live and work in the study area. A lack of available housing in the West Plains is often deemed a primary reason for the high commuter trips.

Current Land Use Development Projects

The following are some of the current development projects in the study area:

- Abbott Industrial park
- Aspen Single Family Home Development ~500 units
- Kalispel Tribe Expansion Developments
- North 40 Outfitters
- Spokane Airport Transload Facility
- Spokane Tribe Development
- Hunters Crossing
- Puget Pipe and McKinstry Co.

The map in **Figure 8** provides a more complete view of current development in the study area.

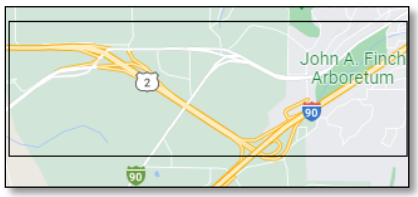
Current Infrastructure Projects

In addition to the study's strategies, the following are other current infrastructure projects that have previously been planned:

- Hayford Road Dual Southbound Left Lanes Project
- 6th/10th/12th Parallel Roadway Network – Partial Build Grant
- Spoko Fuel Roundabout
- Craig Rd Roundabout
- Lyons Rd Improvements
- STA High Performance Transit Lines

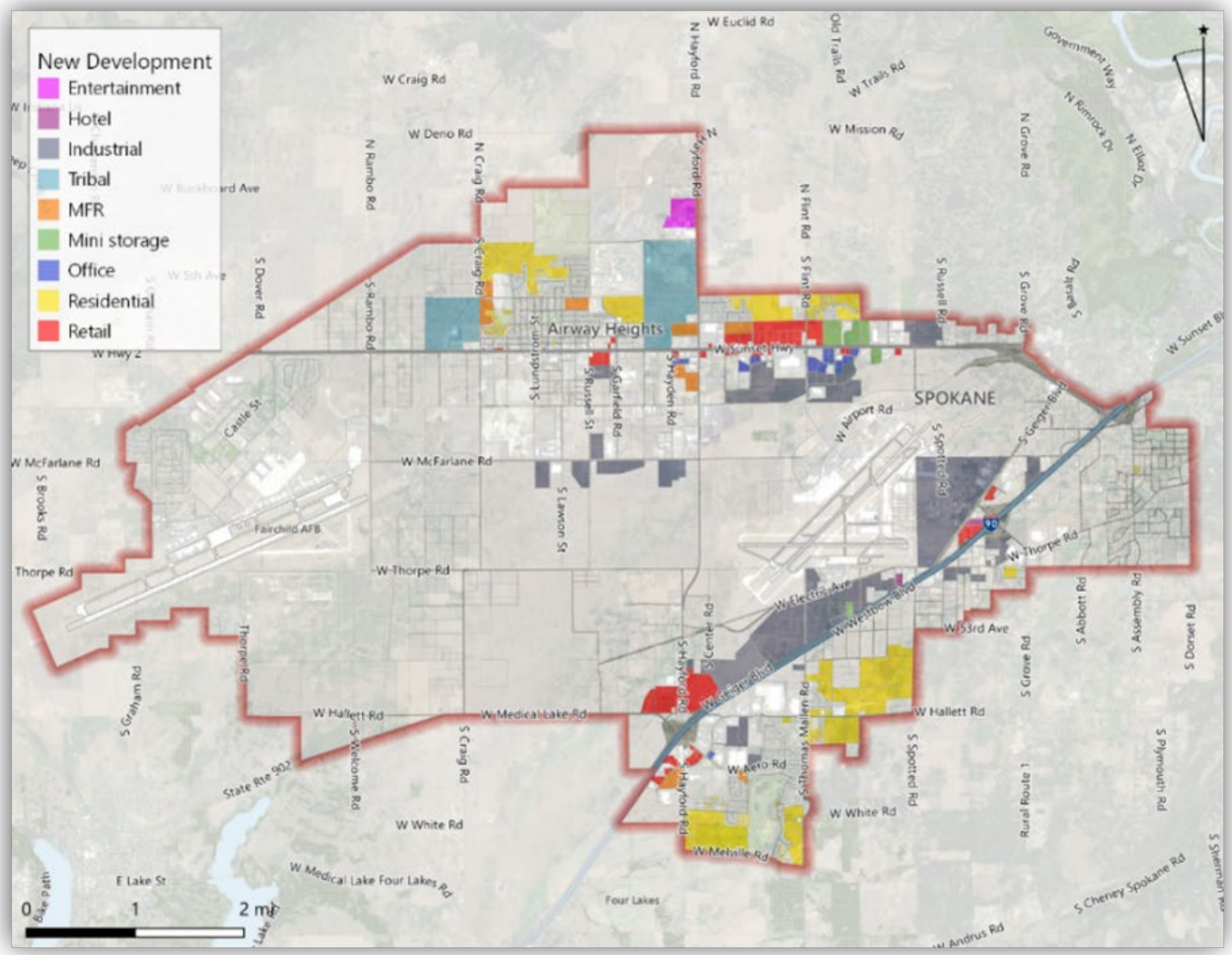
Environmental Assessment

An environmental assessment was completed by both the WSDOT Eastern Region Environmental and Headquarters Environmental divisions. The environmental assessment identified there were no chronic environmental deficiencies and rated the climate vulnerability as low. Two fish barriers on US 2, as well as two fish passage barriers and a non-fish crossing on I-90, were identified. There was an apparent high occurrence of moose-vehicle collisions, between Russell Road and John A. Finch Arboretum areas, that suggested a need for a wildlife crossing. The full assessment is available in the Appendix.



Map showing area where a wildlife crossing is needed and could be constructed

Figure 8 - Current Development Projects



West Plains Subarea Transportation Management Plan map showing development in the study area.

FUTURE CONDITIONS AND NEEDS

Future conditions were forecasted and analyzed to identify needs through the year 2040, with a focus on the impacts of the projected significant growth in land use for the West Plains.

Market Land Use Assessment

Picture of the Amazon Distribution Center being constructed in 2019

Traditionally, land use projections developed by SRTC as part of their travel demand model would be used to forecast future traffic conditions. However, with the West Plains area being one of the fastest growing in the state, a new methodology was used to create a more refined and tailored estimate of what could develop by the year 2040.

The Leland Consulting Group was contracted to conduct an independent market-based development forecast – known as a market land use assessment – to better forecast the development potential of vacant and underutilized properties within the study area. This assessment combined stakeholder interviews with an economic analysis of the following:

- Demographics
- Employment
- Development trends
- Real estate dynamics
- Zoning
- Supporting infrastructure
- Available land
- Strengths and weakness of the study area

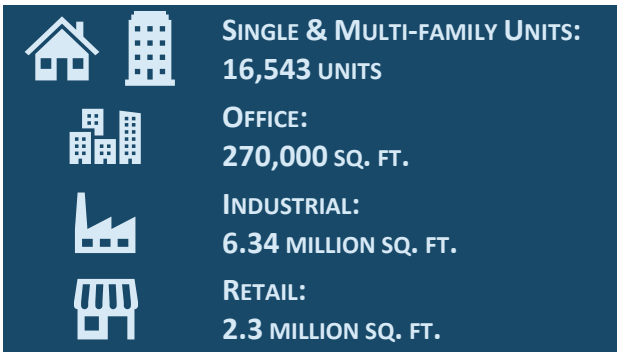
The results of the assessment were used to better refine the land use inputs used to model traffic forecasts for the planning horizon year of 2040.

The assessment found that there are ample opportunities for continued land use growth in the study area and concluded the following development trends:

- Continued tribal land build out, with major development expected
- Additional Amazon and associated development
- US 2 and I-90 build out, with development clustering around these facilities
- Potential but highly unpredictable development on airport-owned land
- Hotel growth
- Limited office (innovation park)

Figure 9 shows the new development demand estimated by the assessment through 2040, which represents an unprecedented rate of development for the area, especially for housing and industrial uses and Fairchild Air Force Base.

Figure 9 – Summary of Estimated Study Area Land Use Growth



Graphic showing the estimated growth by land use category by 2040 in the study area

Documentation and findings of the market land use assessment are included in the Appendix.

Future Road Network

The US 2 study corridor is built out as a four-lane principal arterial with a two-way center left turn lane. Two planned parallel routes are expected to add east-west capacity: 6th/10th/12th Ave to the north of US 2 and 18th/121st Ave to the south. **Table 4** documents all study intersections with their future traffic control, as assumed and analyzed for as part of this study. However, all future intersection control is subject to change and requires a traffic intersection study for approval. The Traffic Control Plan in the "Practical Solutions" section provides maps of these intersections and their traffic control along with the two parallel routes.

Table 4 - Future Study Intersections

Intersection	Planned Traffic Control
Mitchell Street (Fairchild Air Force Base entry) / US 2	Signal
Rambo Road / US 2	Two-Way Stop
Spoko Fuel Access Road / US 2	Roundabout
Spokane Tribe Casino Access Road / US 2	Roundabout
Craig Road / US 2	Roundabout
Lundstrom Street / US 2	Roundabout
King Street / US 2	Right In/Right Out, (no left turns from US 2)
Lawson Street / US 2	Roundabout
Campbell Street / US 2	Right In/Right Out, (left turns allowed from US 2)
Russell Street / US 2	Right In/Right Out, (left turns allowed from US 2)
Garfield Road / US 2	Roundabout
Lyons Road / US 2	Roundabout
Hayford Road / US 2	Signal
Deer Heights Road / US 2	Roundabout
Lucas Drive / US 2	Right In/Right Out, (left turns allowed from US 2)
Flint Road / US 2	Signal
Technology Boulevard	Right In/Right Out, (left turns allowed from US 2)
Spotted Road / US 2	Roundabout
Sunset Frontage Road / US 2	CLOSED, connects into new 6th/10th/12th Ave.
Russell Road / US 2	CLOSED, connects into new 6th/10th/12th Ave.

NOTE: ALL future intersection control is subject to change and requires a traffic intersection study for approval.

Future Traffic Forecasts

Travel Demand Model

This study used the 2015 SRTC base regional travel demand model provided by SRTC and the corresponding 2040 SRTC forecast model (model releases dated December 2017). As part of a "due diligence review" WSDOT typically reviews the base model to ensure the following areas reflect the actual base year conditions:

- Functional classifications (FFC) to align with FHWA approved base year FFC map
- Centroid connectors are placed offset from intersections and are contained within the boundary of the Transportation Analysis Zones (TAZs) and distribution splits equal 100%
- Distribution splits of centroid connectors equal 100%
- Node intersection types, such as two-way stops, roundabouts, signals, etc.,
- Roadway geometries reflect actual base year conditions by adding two-way left turns, adding any existing FFC roadways, "allowed" turning movements at the nodes, and
- Roadway posted speed limits.

In an effort to align with the US 195 study's model analysis, this study did not apply the "due diligence review" network edits or any other changes to the 2015 SRTC Base Model. The potential network edits identified during the "due diligence review" were run in the 2015 base model and found to result in insignificant outcomes. Therefore, the edits were not proposed to SRTC for use in the base model.

For the 2040 forecast model, only necessary refinements were made within the study area, such as: refinement to the network coding, geometry changes, centroid connectors, and refinement of overall vehicle trip generation outputs (as described in the following subsection). The roadway network was also reviewed to verify that all planned roadway improvement projects likely to impact travel patterns within the study area are included, based on our review of the Statewide Transportation Improvement Plan (STIP) for financially constrained funded projects.
The travel demand model methodology used for this study is the same as the US 195 study.

Trip Generation

SRTC's travel demand model bases its trip generation by land use type on data gathered during the region's last travel survey, which was in 2005. Given the age of this data, this study aimed to modify the model's trip generation within the study area to align with trip generation rates found in the Institute of Transportation Engineers (ITE) trip generation manual through "factoring" the land use amounts used by the travel demand model. ITE trip generation rates have been found to align more closely with recent traffic counts taken within the region compared to those collected from the 2005 travel survey.

As described in Leland Consulting Group's market land use assessment documentation (available in the Appendix), in order to validate trip generation from the land uses in the 2040 travel demand model, the following five dynamic tests were performed to determine

trip generation rates assumed in the model using a TAZ within the study area:

- Add 100 single family dwelling units
- Add 100 multifamily dwelling units
- Add 100 non-CDB retail employees
- Add 100 office employees
- Add 100 industrial employees

The PM peak hour trips generated before adding the test land uses were compared to the PM peak hour trips generated after adding the test land uses to isolate the trip rates used by the travel demand model for each land use category. A factor was then developed for each land use category to achieve a trip generation within 10% of the ITE trip generation rates. The factors were applied to the results of the market land use assessment within each study area TAZ prior to rerunning the 2040 travel demand model. As stated previously, the same process was used for the US 195 study, aligning the market land use assumptions between the two studies for congruency

Strategy Testing

The 2040 SRTC travel demand model with the previously mentioned modifications served as a starting point for the analysis of proposed improvement strategies as appropriate. Based on the proposed strategies, the travel demand model was updated and model outputs based on applicable performance measures were extracted. Changes to the travel demand model related to testing strategies included the addition of new roadway connections and changes in node and/or link types/FFC classifications, and only within study area. All changes were submitted to SRTC for acceptance. Change in model volumes and mode choice were reviewed to understand how the proposed strategies effect the transportation system as a whole.

Traffic Forecasting

Since the base SRTC travel demand model was for the year 2015 and traffic counts taken were in 2019, model output volumes from the 2015 travel demand model were grown to the year 2019 in order to match the actual traffic counts taken in the field (an apples-to-apples comparison). The 2015 modeled volumes were grown to 2019 by using a historical growth rate of 1.5% compounded annually, as recommended by SRTC.

Turning movement output volumes from the 2019 travel and 2040 demand models were used for post-processing. An Excel spreadsheet was developed to conduct the post-processing using the difference method (NCHRP Report 765), as well as the *Furness Method.* The spreadsheet calculated the post-processed volumes by applying the growth between the 2019 and 2040 modeled volumes and applying it to the actual 2019 traffic counts. This methodology applies a broader stroke to traffic forecasting that reduces model error by avoiding intersection level model anomalies that may occur and by relying as much as possible on observed data rather than model output data.

The spreadsheet also allowed the final volumes to be balanced as needed to account for model anomalies and discrepancies at the intersection level of detail, allowing post-processed and balanced volumes to be input into the SIDRA software (traffic operational analysis software).

Because the Excel spreadsheet tool does not recognize right-in/right-out only turn movements in the volume balancing portion of the workbook, the final volumes were adjusted redistributing the thru or left turn volumes to the same allowed turn movements for intersections, where these intersections are right in right out only on the minor side streets, and left turns are allowed off of US 2 onto the side streets.

The final post-processed and balanced traffic forecasts for the 2040 AM and PM peak hours are shown in **Figures 10 and 11**. The traffic volumes are considered planning-level and can be easily used for upcoming planned projects for the design phase.

Future Traffic Operational Analysis

A planning level traffic operational analysis was completed by inserting the post-processed and balanced 2040 traffic forecasts into a SIDRA network comprised of the intersections listed in **Table 4**. The paralleling planned roadways, 6th/10th/12th and 18th/21st Avenues were also input into the SIDRA software for analysis; however, only the "modeled volumes" were input for the parallel roadways. Volumes for the parallel roadways were balanced but not post-processed since those roadways do not yet exist, thus model volumes could not be applied to counts.

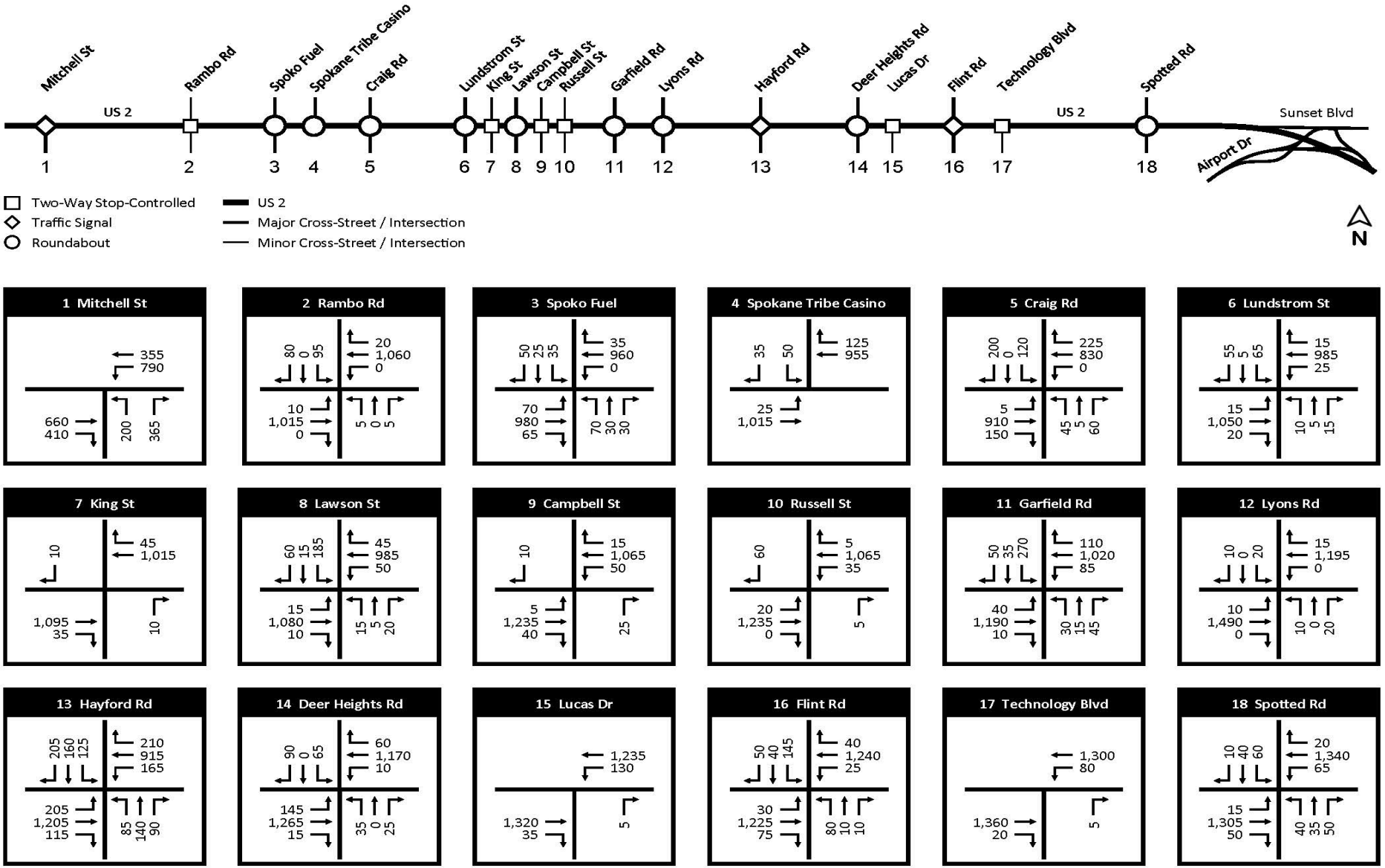
When post-processed future volumes were analyzed using a network analysis in SIDRA and the future US 2 improved intersections, the number of trips arriving during both the AM and PM peak periods for various movements at numerous intersections did not equal the forecasted demand for those movements, creating a shortage. This was because movements that feed the shorted approaches were either over capacity or hindered by opposing traffic movements, creating bottlenecks.

With the demand still forecasted to exist regardless of capacity constraints, a process was needed to identify the magnitude of the oversaturation, with the purpose of determining if and by how much alternative travel methods could accommodate these trips.

Oversaturation Identification

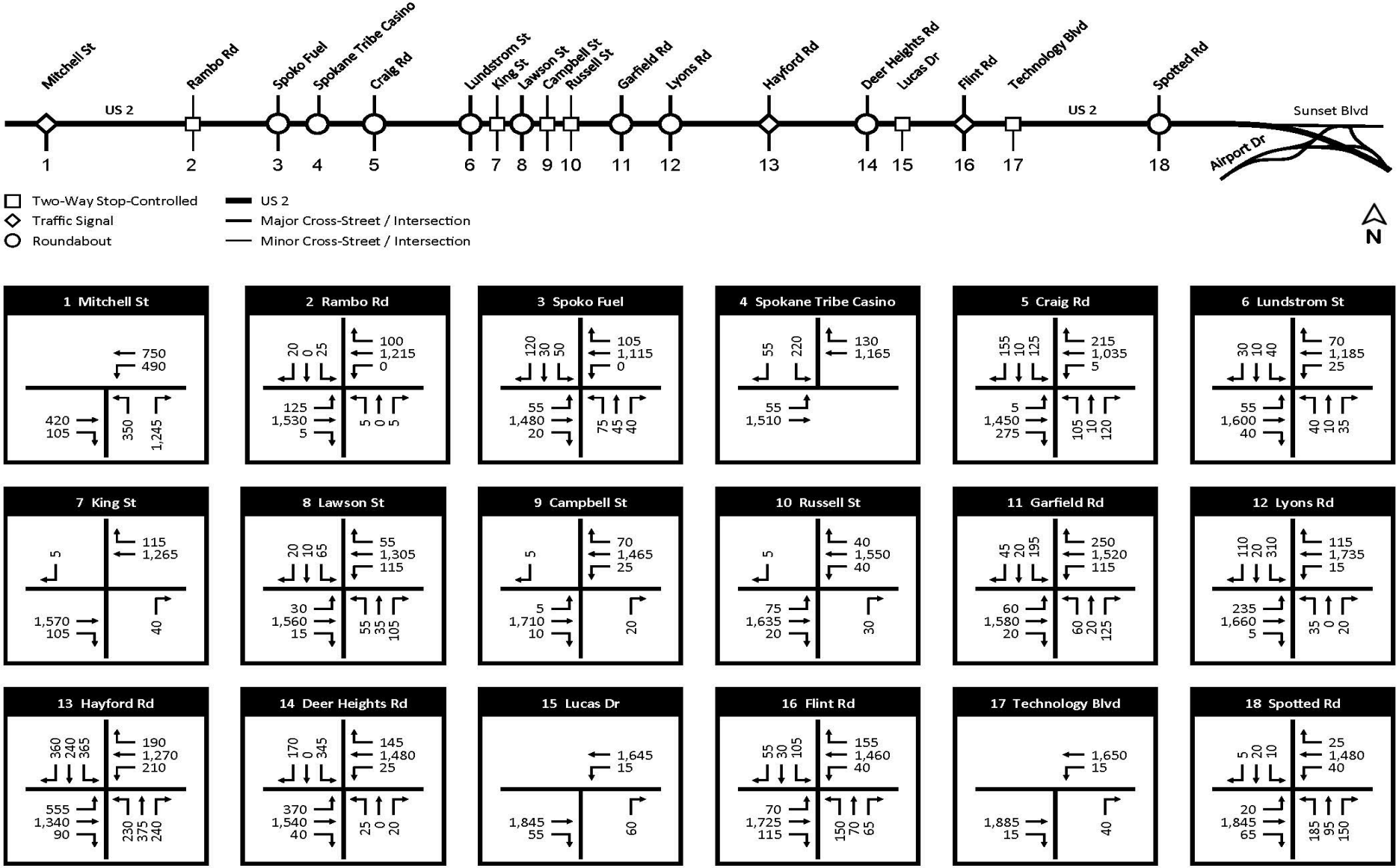
Both demand and actual arrival volumes per movement, intersection, and time period were inserted into Excel to track the shortages. For any approach with a shortage, the feeding movements were inspected to identify if any had a volume/capacity ratio greater than 1.0. If so, those movements were reduced until the shortage was corrected. This was an iterative process tracked in Excel and tested in SIDRA. The process was conducted up and back in both directions along the corridor until all shortages were corrected. Reductions were tracked according to the reason for the reduction (mainly which intersection caused the need to reduce) to identify the purpose behind any reduction along the corridor.

Figure 10 - US 2 Future (2040) Balanced Intersection Turning Movement Forecasts - AM Peak Hour



Graphic of 2040 AM peak hour balanced intersection turning movement forecasts

Figure 11 - US 2 Future (2040) Balanced Intersection Turning Movement Forecasts - PM Peak Hour



Graphic of 2040 PM peak hour balanced intersection turning movement forecasts

The exercise calculated the number of trips that result in an oversaturated corridor by aggregating all oversaturated ("removed") trips for both the AM and PM peak hours that were to enter the corridor from either end (Mitchell St to the west and Spotted Rd to the east) and any cross-street in between. To account for traffic variances on a daily basis, the oversaturation is being expressed as a range. It is estimated that by 2040 the corridor will be oversaturated by 150 to 450 vehicles per peak hour.

As part of the oversaturation evaluation process, the following movements were found to be trouble spots, causing the observed bottlenecks.

AM Peak Hour:

- Southbound Rambo Rd shared left/through/right lane
- Eastbound Hayford Rd shared through/right lane

PM Peak Hour:

- Southbound Rambo Rd shared left/through/right lane
- Northbound Rambo Rd shared left/through/right lane
- All lanes of eastbound Hayford Rd
- Westbound Hayford Rd through-only lane
- Eastbound Flint Rd through-only lane

Alternative Travel Methods to Accommodate Oversaturation

Although the corridor is expected to be oversaturated by 150 to 450 peak hour trips, the demand for these trips (referred to as "targeted diversion trips") remains. The strategies developed for this study (see the Practical Solutions section) were reviewed to identify how many trips could be diverted via alternative travel methods. **Table 5** provides a range of trip diversion for each strategy category, which results in an estimated total of 410 to 2,355 peak hour trips that could be diverted.

Table 5 - US 2 Trip Diversion Potential by Multimodal Strategy

Multimodal Strategies Category	Peak Hour Trip Diversion Range (trips per peak hour)
Active Transportation*	5-30
Public Transit	5-20
Commute Trip Reduction (CTR) / Travel Demand Management (TDM)	275-1,920
Traffic Operations / Intelligent Transportation System (ITS)	115-360
Freight (divert to 18th/21st Ave)	10-30
Total Potential Diversion Range	**410-2,355**
Targeted Diversion Range	**150-450**

* Includes walking, biking, and emerging modes such as e-bikes and electric scooters.

The low end of both the targeted and potential diversion ranges is associated with the AM peak hour, while the high end is associated with the PM peak hour. However, day-to-day variations are expected, which is why trips are expressed as low/high ranges rather than by peak hour. Based on this understanding, the potential diversion range of 410 to 2,355 peak hour trips accounts for the targeted diversion range of 150 to 450 peak hour trips. The following subsections provide additional information regarding the diversion ranges for each strategy category.

It should be noted that the targeted diversion range of peak hour trips is only an estimate of overcapacity and not the amount targeted for improved operations along the corridor. If the strategies developed for this study divert more trips than the targeted diversion range, which is possible given that the potential for diversion generally exceeds the targeted range, locations with operational deficiencies will experience an improvement.

Active Transportation

The 5-Year 2019 American Community Survey (ACS) estimates that walking and biking account for 1.8% and 0.3% of trips in Airway Heights (a total of 2.1%), while the Spokane urbanized area as a whole experiences 2.6% and 0.5% respectively (a total of 3.1%). Taking into account the active transportation strategies developed for the study, that the City of Airway Heights is currently seeking to add electric scooter share, and the rise in popularity of e-bikes could reasonably translate into the area achieving today's active transportation average mode share for the Spokane urbanized area as a conservative low end estimate, about 3%.

For the high end of the range, if land use patterns change in the future and adoption of the active transportation modes is higher than traditionally experienced in the area, a share closer to 6% was considered. Such a share is more similar to areas like Seattle, which currently experience a walk share of 7.7% and bike share of 3.1% (a total of 10.8%), but tempered for the context of the area even with substantial changes.

The mode share percentages were multiplied against the targeted diversion range of trips to arrive at an estimated 5-25 peak hour trips that could be diverted as a result of active transportation.

Public Transit

The 5-Year 2019 ACS estimates that public transit accounts for 2.2% of trips in Airway Heights, while the Spokane urbanized area generally experiences 3% and the City of Spokane experiences 3.9%. For the low end of the range, a mode share of 2% was used in the event the corridor does not receive significant changes in transit service, as high-performance transit (HPT) is planned for the corridor but is currently unfunded and is not as high of a priority compared to other corridors in the Spokane area.

Data from STA to compare ridership in Airway Heights after the West Plains Transit Center was constructed and routing reconfigured for Airway Heights was not available due to ridership fluctuations as a result of the COVID-19 pandemic. Similarly, data on before and after ridership for corridors that had HPT implemented elsewhere in Spokane were not available. However, should significant investments be made for the corridor, including HPT, it's reasonable to estimate that a high end of the range could align with what the City of Spokane experiences at 4%.

The mode share percentages were multiplied against the targeted diversion range of trips to arrive at an estimated 5-20 peak hour trips that could be diverted as a result of public transit.

Commute Trip Reduction (CTR) /Travel Demand Management (TDM)

According to the Washington State Commute Trip Reduction Board's 2017 Report to the Legislature, commuters who are provided CTR/TDM programs will typically choose options other than drive alone 12% more than those who are not provided such programs. The 5-Year 2019 ACS estimates Airway Heights already has a non-drive alone mode share of 17.6%, including 11% carpool. However, this is 10 points less than the statewide average of 27.4% and 5 points less than the average for the Spokane urbanized area which is 22.7%.

To estimate the future impact of CTR/TDM strategies, the total number of expected employees by 2040 was multiplied by the percent increase in non-drive alone mode share from a result of CTR/TDM programs. For the low end of the range, a very conservative 1% increase was used. This takes into account the study area's employment mix isn't as versatile when it comes to some CTR/TDM strategies such as working from home, as industrial land uses make up the largest portion of employment. For the high end of the range, 60% of the observed 12% difference noted above - or 7% - was used given Airway Heights's non-drive alone share is about 60% that of the statewide average.

With roughly 27,500 employees forecasted for the study area, an estimated range of about 275-1,920 peak hour trips could be diverted with the availability of CTR/TDM options.

Traffic Operations/ITS

Studies and data regarding the impact of ITS and modifications to traffic operations to influence a change in trip routing is lacking. However, a study sponsored by the Michigan Department of Transportation via the ENTERPRISE Pooled Fund and conducted by Athey Creek Consultants in 2012 looked at this topic by analyzing traffic data for several sites in Minneapolis, MN and Seattle, WA. The Seattle data suggested that the difference in travel time between the primary route and the alternative route needed to exceed 20 minutes before a significant number of travelers changed their route, while data from Minneapolis suggested route diversion could be obtained with a travel time differential as low as 5 to 10 minutes.

No estimates on the magnitude of travel time differences in the future between US 2 and the planned parallel routes of 6th/10th/12th Avenue and 18th/21st Avenue are available. As a proxy, the differences in existing observed AM and PM peak hour travel times by direction along US 2 between Mitchell Street and Spotted Road were compared with the estimated travel times in 2040, as produced by the SIDRA network models. The differences ranged from 3 to 8 minutes of increase by 2040 depending on the direction and peak hour, which is within the 5-10 minute range that was used as the low end for the Minneapolis case study.

Analysis of the Minneapolis data yielded a diversion to an alternative route of 5% to 12% through the use of travel time messaging signs, which were used as the low and high end of the range for this study. These percentages were applied to the AM and PM peak hour through movements of westbound US 2 approaching Spotted Road and eastbound US 2 approaching Rambo Road, east of Mitchell Street. These

locations were selected as the most likely locations to distribute travel time information to impact travel routing. The minimum calculated amount of 115 peak hour trips was used for the low end of the range, while the maximum calculated amount of 360 peak hour trips was used for the high end of the range.

Freight

WSDOT's 2019 Freight and Goods Transportation System (FGTS) Update notes that the study corridor currently experiences 4.7% of its traffic as heavy trucks. As part of the land use projections used for the travel demand modeling, industrial land use is projected to the be the land use with the greatest amount of employment growth for the study area. However, other land uses with higher trip generation rates are also expected to grow along with pass-through trips using the corridor.

For the low end of the range, a slight traffic share increase to 5% is a reasonable conservative estimate. For the high end of the range, given the expected growth in industrial land uses, a 6% share of traffic was used.
The traffic share percentages were multiplied against the targeted diversion range of trips to arrive at an estimated 10-30 peak hour heavy truck trips that could be diverted.

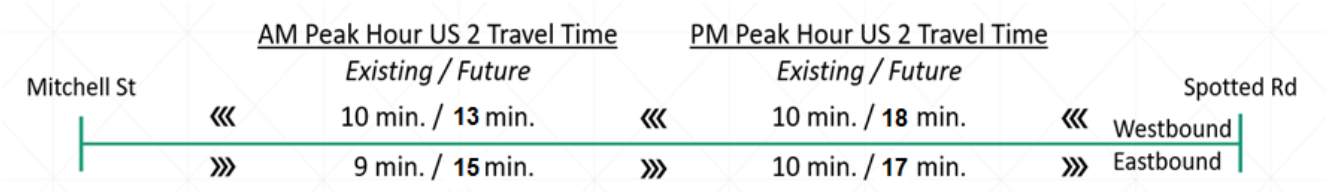
Future Corridor Travel Time

The SIDRA network analysis also provides estimated future travel times along the study corridor. As shown in **Figure 12**, 2040 travel times are projected to increase in the AM peak hour from 10 minutes today to 13 minutes for westbound traffic and 9 minutes today to 15 minutes for eastbound traffic. In the PM peak hour, travel times are projected to increase from 10 minutes for both directions today to 18 minutes for westbound traffic and 17 minutes for eastbound traffic. The future 2040 estimated travel times can be reduced by developing and implementing the strategies identified in the Practical Solutions section.

Multimodal System Needs

A multimodal focus was used throughout the study efforts and found that improvements to all modes - bicyclists, pedestrians, vehicles, freight, and transit - will be required to address existing and future mobility and safety needs. Strategy outcomes derived from the Practical Solutions Lab efforts also included looking at Transportation System Management and Operations (TSMO) strategies in an effort to improve and provide low-cost, practical solutions for all modes of transportation within the study area. Multimodal strategies are provided in the Practical Solutions section.

Figure 12 - Existing versus Projected 2040 Travel Times along US 2



Graphic comparing existing travel times to projected 2040 travel times along US 2

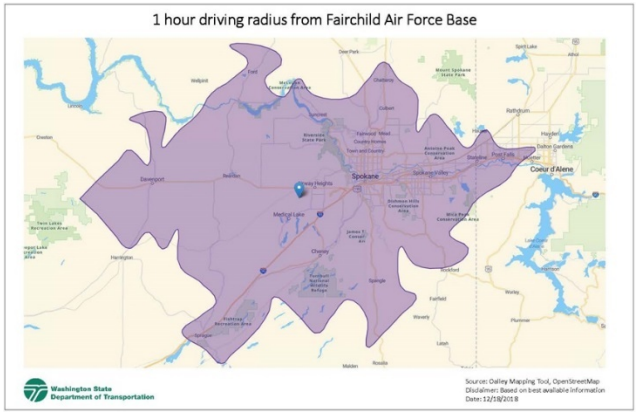
Fairchild Air Force Base

Picture showing the Fairchild Air Force Base signage

Fairchild Air Force Base is a military installation located at the west end of the study limits. Trips serving this facility is one of the primary users of US 2 and I-90 in and around the study area. The travel time distance for base staff and personnel to live and work between the base is based on a 1-hour travel time, as shown in **Figure 13**. As mobility decreases along this corridor, so does the radius and the areas in which staff and service personnel can live, meaning they will have to live closer to the base in order to meet the service response time required by the base. WSDOT will continue to be an advocate for the military installation's travel time along the corridor.

Concerns were raised regarding the planned 18th/21st Avenue parallel roadway network from the base installation. Fairchild Air Force Base's main water pipeline is located in and on the edge of the planned roadway that runs from the base along the proposed 18th/21st Avenue alignment, across US 2, through the Palisades Park area, and finally terminates in an area along the Spokane River pulling water from the Rathdrum Aquifer. Fairchild Air Force Base has plans in the next few years to replace the aging water line originally put in place in the early 1940's when the base opened. This is critical to ensure the pipeline is in place before the new road is place over top of the easement. In moving ahead with proposed 18th/21st Avenue design and construction, continued communication and collaboration needs to occur with all vested parties, particularly relating to existing major public utilities and current plans by utilities to run high pressure gas lines in the same easements. Care must be taking to not disturb the location of the Fairchild Air Force Base water line as the operation on the base depend on this source of water.

Figure 13 - Fairchild Air Force Base 1-Hour Travel Response Time Radius



Map showing the 1-hour driving distance that all service members can reside within

PUBLIC AND STAKEHOLDER ENGAGEMENT

The following section documents the numerous touch points the project had with the public and stakeholders, particularly the study's jurisdictional partners. The findings of the Environmental Justice Assessment informed the public engagement design.

Web-Based "Living Study"

The West Plains Subarea Transportation Management Plan, Phase 1, US 2 Vicinity study is a "live" ongoing study that will be updated for years to come via the project webpage located at www.connectwestplains.com. Although this report is the final documentation for Phase 1, the webpage will continue to be updated when new data becomes available.

During the Phase 1 study, the webpage hosted project related data throughout the study process and included links to project surveys. The webpage also served as the host site for two online open houses, described in more detail on the following page.

Community Listening Posts

In 2019, the public was engaged through the use of several "listening posts" at community activity centers and events, including:

- Medical Lake Founders Day
- Sunday Fest at Northern Quest Resort & Casino
- Airway Heights Festival
- Fairchild Air force Base
- Yokes Grocery Store
- Smart Commute NW Employee Transportation Coordinators Luncheon (September 2019)
- Growth Management Act (GMA) Steering Committee of Elected Official Meeting (September 2019)

The above events involved an information listening post where we shared information and received input on opportunities to address the multimodal transportation system in the study area and along the study corridor.

Community Engagement Surveys

The community has also provided input via three surveys. Nearly 1,500 total surveys were received from citizens that live and work both inside and outside of the West Plains area. All surveys were open for 90 days during April, May, and June and were available to take online or at community listening posts. Partner agencies, such as the City of Spokane, helped advertise the West Plains surveys on their website, blog and social media accounts and the survey links were promoted by the City of Airway Heights via the Nextdoor mobile application. WSDOT also posted the survey links on the project website www.connectwestplains.com. **Table 6** describes the three surveys and number of responses.

The West Plains Survey Analysis Report, which is available in the Appendix, found that several major themes emerged about the community's perception of the West Plains and US 2 corridor that have significant overlap across the three surveys and should be considered in an effort to respond to the community's preferences:

- Enhance the local roadway network connections and traffic control
- Enhance the bicycle and pedestrian mobility with sidewalks, trails, and bike lanes
- Encourage housing developments to integrate green space for children and families that are well connected to existing and future trails and other desired destinations
- Enhance the capacity of Fairchild Air Force Base's main gate to relieve congestion on US 2 or improve connection from 1-90 to the main gate
- Support projects that enhance public transportation

Table 6 - Community Surveys

Survey	Purpose	Responses
West Plains Subarea Transportation Management Plan Survey Questions (June 2019)	Receive input about improving mobility around the US 2 corridor	634
West Plains Subarea Transportation Management Plan - Typical Daily Travel Survey (June 2019)	Identify when and why participants use the US 2 corridor	447
West Plains Subarea Transportation Management Plan Supplemental Survey (June 2019)	Identify focus topics and rate Airway Heights as a place to live / work / visit	408

In summary, while traffic congestion is of concern to West Plains commuters, opportunity exists to improve safety for all users by enhancing bicycle and pedestrian connections and improving the local network.

Online Public Open Houses

WSDOT also held the following online meetings via the Zoom video conferencing software to engage the public:

- August 24, 2021 (5:00 pm to 7:30 pm)
- August 26, 2021 (Noon to 2:30 pm)

The online meetings were supplemented with an Online Engagement Virtual Open House that was available for ten days (August 23rd through September 3rd, 2021) on the project website located at www.connectwestplains.com.

Prior to the online events, a postcard with information regarding the Zoom meetings and online open house was sent to study partners to share on their websites. The information was also shared via social media platforms including the WSDOT Facebook and Reddit accounts along with the West Plains Nextdoor group.

Online public open house flyer

Technical Advisory Team Meetings

Project meetings with the Technical Advisory Team (TAT) were held regularly throughout the study to facilitate a collaborative, informative, transparent, and cooperative planning process. All study milestones and phases were collaboratively developed and refined though the TAT.

Multi-Disciplinary (M2) Meetings

In addition, Eastern Region Planning presented to the WSDOT Headquarters M2 multi-disciplinary team comprised of traffic engineers, planners, transportation engineers and others throughout the study process. The M2 team provided oversight of the study, offering suggestions and study procedural guidance. Eastern Region Planning met with the M2 team at the beginning, middle, and end of the study process.

Final Study Report-Out Meetings

WSDOT Eastern Region Planning met with our study partner jurisdictions and agencies to report out the study findings and to receive concurrence of the emerging strategies that were developed through the study efforts, as shown below:

- City of Airway Heights Council initial study outcomes presentation (August 9, 2021)
- City of Airway Heights Council follow-up presentation (August 16, 2021)
- City of Airway Heights Council study outcomes concurrence presentation (August 23, 2021)
- City of Spokane Urban Experience Committee (September 8, 2021)
- City of Spokane Planning Commission (September 8, 2021)
- WSDOT HQ Active Transportation Group (September 13, 2021)
- SRTC Technical Transportation Committee initial study outcomes presentation (September 22, 2021)
- S3R3 Solutions Board Meeting (October 14, 2021)
- SRTC Board Meeting initial study outcomes presentation (October 14, 2021)
- SRTC Technical Transportation Committee study outcomes concurrence presentation (October 27, 2021)
- Spokane Tribe (November 2, 2021)
- Kalispel Tribe (November 4, 2021)
- SRTC Board Meeting study outcomes concurrence presentation (November 11, 2021)
- Spokane International Airport Board Meeting (to be determined)

Practical Solutions Lab/Workshop

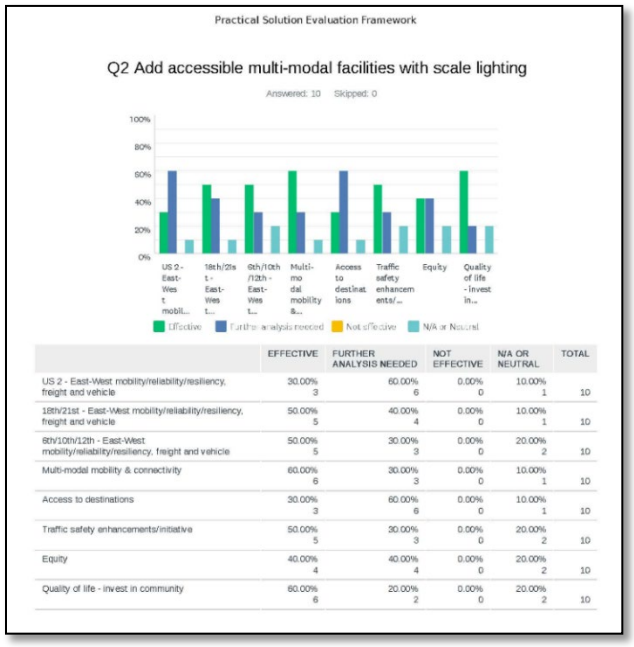
A two-day Practical Solutions Lab workshop was held virtually by WSDOT Eastern Region Planning on March 31, 2021 and April 6, 2021. There were over 40 participants comprised of members of the TAT and WSDOT Subject Matter Experts (SMEs). The purpose of the workshop was to collaboratively develop strategies that would then be evaluated using “Performance Measure Goals” to develop low-cost Practical Solution strategies in order to improve mobility and safety along the US 2 study corridor. The “Performance Measure Goals” used are as follows:

- East-West Mobility/Reliability/Resiliency, Freight and Vehicle
- Multimodal Mobility & Connectivity
- Access to Destinations
- Safety
- Equity
- Quality of Life

The Practical Solutions lab/workshop was divided into separate categories to be in alignment with potential future funding opportunities. Each category was represented by at least one WSDOT SME. Prior to the workshop, WSDOT SMEs researched existing conditions as well as data/information provided from the study efforts. The SMEs provided their expertise and suggestions to the TAT and WSDOT Eastern Region Planning staff. The following categories were selected:

- Safety
- Freight
- Environmental
- Equity
- Active Transportation
- Public Transportation
- Transportation Management Systems Operation (TSMO Strategies)
- Traffic Operations
- Land Use

The TAT and WSDOT SMEs collaboratively developed over eighty strategies during the workshop, with each placed in the categories previously noted. Via an electronic survey, the strategies were presented to the TAT for evaluation.



	EFFECTIVE	FURTHER ANALYSIS NEEDED	NOT EFFECTIVE	N/A OR NEUTRAL	TOTAL
US 2 - East-West mobility/reliability/resiliency, freight and vehicle	30.00% 3	60.00% 6	0.00% 0	10.00% 1	10
18th/21st - East-West mobility/reliability/resiliency, freight and vehicle	50.00% 5	40.00% 4	0.00% 0	10.00% 1	10
8th/10th/12th - East-West mobility/reliability/resiliency, freight and vehicle	50.00% 5	30.00% 3	0.00% 0	20.00% 2	10
Multi-modal mobility & connectivity	60.00% 6	30.00% 3	0.00% 0	10.00% 1	10
Access to destinations	30.00% 3	60.00% 6	0.00% 0	10.00% 1	10
Traffic safety enhancements/initiative	50.00% 5	30.00% 3	0.00% 0	20.00% 2	10
Equity	40.00% 4	40.00% 4	0.00% 0	20.00% 2	10
Quality of life - invest in community	60.00% 6	20.00% 2	0.00% 0	20.00% 2	10

Image of an example strategies survey question and its responses

As part of the evaluation, the TAT prioritized the strategies based on technical understanding of the respective strategy's predictive effectiveness to address the specific category. For example, in the list of strategies for the Safety category, the highest ranked strategy for effectiveness based on the TAT's response was the "Add accessible multimodal facilities with scale lighting."

PRACTICAL SOLUTIONS

Practical Solutions strategies presented in this section were collaboratively developed during the Practical Solutions Lab/Workshop, as documented in the Public and Stakeholder Engagement section. The complete list of multimodal Practical Solutions strategies for the corridor were aggregated into the following categories:

- Safety
- Freight
- Environmental
- Equity
- Active Transportation
- Public Transportation
- Transportation Management Systems Operation (TSMO Strategies)
- Traffic Operations
- Land Use

Table 7 provides the full list of multimodal Practical Solutions Strategies.

Traffic Circulation Plan

The TAT developed a "Traffic Circulation Plan In and Around US2 Corridor" to provide more detail regarding the traffic circulation aspects of the Practical Solutions strategies. The traffic circulation plan looks at the area in and around US 2 for intersection control along the corridor. The corridor area includes the 6th/10th/12th and 18th/21st Avenues planned parallel corridors.

The traffic circulation plan proposes ten roundabouts along the US 2 corridor, including the existing roundabouts at the Spokane Tribe Casino and Deer Heights Road. As outcomes of the corridor plan evaluation, the following three existing signals along US 2 are not proposed for modification: Mitchell Street, Hayford Road, and Flint Road. Future evaluation may result in modifications.

To reduce conflicting turning movements, turn movements at all minor intersections along the corridor from Fairview Heights Road to Sunset Frontage Road will be restricted to right-in / right-out; however, left turns off of US 2 onto the side streets will be allowed. There is one exception at King Street and US 2 where no left turns from US 2 will be allowed, as this intersection is planned to provide enhanced pedestrian crossings. Ultimately, a level one active transportation crossing is proposed for consideration to accommodate non-motorized travelers ages eight to eighty years old.

Figure 14 provides a map of the planned parallel routes (6^{th}/10^{th}/12^{th} and 18^{th}/21^{st} Avenues). **Table 8** lists the intersection strategies, while **Figures 15 A-C** illustrate the intersection strategies and planned traffic control for all other minor intersections and driveways along the study corridor.

NOTE: ALL future intersection control is subject to change and requires a traffic intersection study for approval.

Table 7 - Categorized List of Multimodal Practical Solutions Strategies Prioritized by Percentage of Effectiveness

SAFETY		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
1	Add accessible multi-modal facilities with scale lighting	For shared use paths within City limits: City of Airway Heights/City of Spokane. Areas associated along US 2: WSDOT/City of Airway Heights/City of Spokane. Areas outside city boundaries: Spokane County/WSDOT and Others
2	Deploy roundabout training and instructional materials to employees and residents within the study area along with driver information (e.g. VMS sign)	WSDOT/Department of Licensing/Driver Education Schools
3	In regards to development, adhere to access management strategies that encourage right in-right out turn restrictions, use of channelization strategies and delineated access points	WSDOT/City of Airway Heights/City of Spokane/SRTC
4	Partner with major traffic generators in providing driver education to address risky behavior	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SRHD/Department of Licensing/Driver Education Schools
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

FREIGHT		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
1	Develop the 18th/21st Ave corridor in a manner that attracts increased freight mobility **** Amended after the Technical Advisory Team Meeting 7/21/21, based on member collaborated comments.*	City of Airway Heights/City of Spokane/Spokane County/S3R3 PDA
2	Ensure intersection control measures along US 2 and 18th/21st are designed to provide for freight mobility	City of Airway Heights/City of Spokane/S3R3 PDA
3	Provide a roundabout at Craig Road/Thorpe Road intersection	Spokane County/City of Airway Heights
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

Table 7 - Categorized List of Multimodal Practical Solutions Strategies Prioritized by Percentage of Effectiveness (continued)

ENVIRONMENTAL		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
1	"Consider" fencing along US 2 east of Spotted RD to I-90 vicinity to divert wildlife	WSDOT/City of Spokane
2	Ensure stormwater treatment areas are designed in a manner that does not attract fowl and negatively affect aviation	WSDOT/City of Airway Heights/City of Spokane/Spokane County
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

EQUITY		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
1	Pursue broadband opportunities along the corridor to ensure equitable access for disadvantaged populations	City of Airway Heights/City of Spokane/WSDOT/S3R3 PDA
2	Install electric vehicle charging stations along and/or in the immediate vicinity of US 2	City of Airway Heights/City of Spokane/S3R3 PDA
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

ACTIVE TRANSPORTATION		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
1	Ensure all pedestrian facilities along US 2 are ADA compliant - on US 2	City of Airway Heights/WSDOT/City of Spokane
2	Provide lighting on US 2 along multi-use paths/sidewalks/trails in high pedestrian crash areas, as presented in the crash analysis	For shared use paths within City limits: City of Airway Heights/City of Spokane. Areas associated along US 2: WSDOT/City of Airway Heights/City of Spokane. Areas outside city boundaries: Spokane County/WSDOT and Others
3	Connect missing sidewalks/trails to provide a complete Safe Routes to School path	City of Airway Heights/Cheney School District/Land Developer

Table 7 - Categorized List of Multimodal Practical Solutions Strategies Prioritized by Percentage of Effectiveness (continued)

ACTIVE TRANSPORTATION (continued)		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
4	City of Airway Heights, Develop and/or update an ADA transition plan for the study area	City of Airway Heights
5	Pedestrian crossings on US 2 need to be located where significant pedestrian crossings are expected (An engineering study will be required for siting specific crossings outside of intersections)	City of Airway Heights/City of Spokane/Land Developer, with WSDOT concurrence
6	Evaluate and provide enhanced crossings where needed along US 2 ; from Craig Rd to Hayford Rd	City of Airway Heights/WSDOT/Land Developer
7	Provide multi-use path down alley of 13th Ave (north of US2 alleyway) between Craig Rd and Russell St to provide for a multi-modal corridor primarily designed for active transportation	City of Airway Heights
8	Minimize pedestrian crossing distance and/or provide center refuge on US 2	City of Airway Heights/WSDOT/City of Spokane/Land Developer
9	Identify opportunities to provide maximized pedestrian crossings for access to destinations in the vicinity of US 2	City of Airway Heights/WSDOT/City of Spokane/Land Developer
10	Repurpose the public owned right-of-way (behind back of sidewalk) to provide for active transportation facilities and designated parking zones (13th/14th Ave) within the City of Airway Heights	WSDOT/City of Airway Heights/City of Spokane
11	Prioritize pedestrian movements on US 2 for intersection design and control for signals	WSDOT/City of Airway Heights/City of Spokane
12	Provide enhanced pedestrian crossings on US 2 (e.g. signs, rapid flashers, HAWK, etc.) Engineering study will be required.	City of Airway Heights/WSDOT/City of Spokane/Land Developer
13	Provide eastbound and westbound bicycle facilities on US 2 within the roadway prism in alignment with the City of Airway Heights Downtown Plan - [Provide roadway bike path on both sides of US from Craig Rd to Russell St - Provide separated multi-use paths on both sides of US 2 from Mitchell St to Sunset Frontage Road]	City of Airway Heights/City of Spokane/Spokane County; with WSDOT concurrence
14	Reduce future lane widths to provide a maximum of 11 feet, in coordination with other complete street strategies along US 2	WSDOT/City of Airway Heights/City of Spokane

Table 7 - Categorized List of Multimodal Practical Solutions Strategies Prioritized by Percentage of Effectiveness (continued)

ACTIVE TRANSPORTATION (continued)		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
15	Plan and develop a level 1 (crossing for all ages; 8 to 80) grade separated crossing at King St/US 2 (or other identified crossing route) to align with the City of Airway Heights downtown plan and Safe Routes to School	S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/Cheney School District; with WSDOT concurrence
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

PUBLIC TRANSPORTATION		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
1	Ensure bus stops are aligned with most frequented activities/destinations	Spokane Transit Authority (STA)/City of Airway Heights/WSDOT/City of Spokane
2	Support increased transit use by creating more pedestrian friendly environment (safe crossings, first and last mile connections, attractiveness and accessibility) and dense corridor place making	STA/City of Airway Heights/WSDOT/City of Spokane
3	Pursue High Performance Transit along US 2	STA/WSDOT
4	Evaluate the provision of business access and transit lanes (BAT) for transit service	STA/City of Airway Heights/WSDOT/City of Spokane
5	Optimize fixed-route transit service increasing frequency and shortening travel time	STA with WSDOT concurrence
6	Develop the US 2, 6th/10th/12th and/or 18th/21st alignments in a manner that supports for long-term bus rapid transit (BRT)	STA/City of Airway Heights/WSDOT/City of Spokane/Spokane County
7	Pursue Tribal Transit Services to connect into Spokane Area *** outside of service hours, currently not served by STA. STA service is: Monday-Saturday: 5:30 am to 11:30 pm / Sundays and Holidays service 8:00 am to 8:00 pm	STA/Kalispel Tribe/Spokane Tribe/City of Airway Heights/City of Spokane
8	ITS Plan - Provide communication in real-time for transit signal priority, transit stations and stops	WSDOT/STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SIA
9	Encourage and focus CTR strategy efforts for largest employers	S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/Spokane Regional Health District (SRHD)

Table 7 - Categorized List of Multimodal Practical Solutions Strategies Prioritized by Percentage of Effectiveness (continued)

PUBLIC TRANSPORTATION (continued)		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
10	Form a transportation management association to support major employers with enhancing CTR (including employer bus passes) See example: https://www.whatcomsmarttrips.org/	S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SRHD
11	Partner with Commute Smart NW in development of subarea CTR Program	S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SRHD
12	Encourage employers to use staggered shift start/stop times to manage traffic demand (seize opportunities to implement this policy during developer SEPA reviews, and comprehensive planning efforts)	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SRHD
13	Add future connection to Route 61 (6th Ave to Craig Rd), and change Route 63 to travel north on Hayford Rd to 10th Ave then back to US 2 (no detour to airport and Geiger)	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/Spokane International Airport (SIA)
14	Coordinate with Amazon to develop a sustainable plan that will increase their CTR program, encourage travel demand management (TDM), and provide Universal Transit Access Pass Program (UTAP)	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SRHD
15	Provide first and last mile connection opportunities using scooters and bikes (e.g.. Lime or similar)	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SRHD
16	Coordinate with employers and others to market and support vanpool/paratransit service	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SIA/SRHD
17	Provide a 24/7 transit option	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SRHD
18	Encourage employers to provide showers, bicycle storage at work sites (seize opportunities to implement this policy during developer SEPA reviews, and comprehensive planning efforts)	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SRHD
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

Table 7 - Categorized List of Multimodal Practical Solutions Strategies Prioritized by Percentage of Effectiveness (continued)

TRANSPORTATION MANAGEMENT SYSTEMS OPERATIONS (TSMO)		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
1	Pursue real-time messaging signs that provide traveler information such as travel times along US 2 versus parallel arterials such as; 6th/10th/12th and 18th/21st (fiber installation required)	City of Airway Heights/City of Spokane/WSDOT
2	Update the ITS Plan to provide: Real-time communications for traffic monitoring, travel information, volumes, speeds, traffic control monitoring, transit signal priority, communication for transit and Fairchild Air Force Base. Also include cameras at Craig, Lawson and Flint, variable message signs, volume counters, and four miles of fiber trunk, (subject to change)	WSDOT
3	Continue periodic speed management studies on US 2 to determine if the speeds match the current change of built environment of the area (e.g., have land uses and traffic volumes increased such that existing speeds need to be reconsidered) and to identify future speed adjustments to account for the roundabouts	WSDOT/City of Airway Heights/City of Spokane
4	Explore opportunity to build a micro mobility hub within the study area, by converting existing park-n-ride lots, intermodal hubs or creating a new space (e.g. Eastgate-Mobility-Hub-Brochure-2019-web.pdf and San Diego Forward (mobility Hubs (sdforward.com)	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County
5	Explore new and emerging technologies that can collect safety analytics and identify countermeasures on US 2	City of Airway Heights/WSDOT/City of Spokane
6	Apply for the Green transportation capital grant program during the 2023-2025 biennium to fund electric charging stations along or near US 2	STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County
7	Continue to support demonstration projects to explore innovative practical strategies including active transportation strategies, such as the "Smart Growth America – Complete Streets Leadership Academy	WSDOT/STA/S3R3 PDA/City of Airway Heights/City of Spokane/Spokane County/SIA/SRHD
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

Table 7 - Categorized List of Multimodal Practical Solutions Strategies Prioritized by Percentage of Effectiveness (continued)

TRAFFIC OPERATIONS		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
1	Provide and Support Alternative Routes specifically; 6th/10th/12th and 18th/21st planned roads	City of Airway Heights/City of Spokane/Spokane County/WSDOT
2	Develop the US 2 roadway context in a manner that supports a lower speed limit 35 mph to 30 mph (City of Airway Heights, Lundstrom to Lawson)	WSDOT/City of Airway Heights
3	Improve Deno Rd (realign/pave) and secure commitment from Fairchild Air Force Base to encourage personnel to use as an alternative route	City of Airway Heights/Fairchild Air Force Base (FAFB)
4	Advance the West Plains Subarea Transportation Management Plan, Phase 1, US 2 Vicinity, 2040 "Traffic Circulation Plan, **SEE "IS Improvements Funding Potential" plan	WSDOT/SRTC/City of Airway Hts/City of Spokane/Spokane County
5	Pursue replacing signal with roundabout (e.g. Flint Road)	WSDOT/City of Spokane
***6	Channelize the US 2 corridor per the West Plains Subarea Transportation Management Plan, Phase 1, US 2 Vicinity "Traffic Circulation Plan" to restrict outbound left turn movements, **SEE "IS Improvements Funding Potential" plan	WSDOT/City of Airway Heights/City of Spokane/SRTC
***7	Install ramp meter at US 2 / I-90 eastbound on ramp (Already in design)	WSDOT
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

***Amended - Moved from "Land Use" category, into correct category "Traffic Operations" in order of percent of effectiveness, after Technical Advisory Team Meeting 7/21/21

Table 7 - Categorized List of Multimodal Practical Solutions Strategies Prioritized by Percentage of Effectiveness (continued)

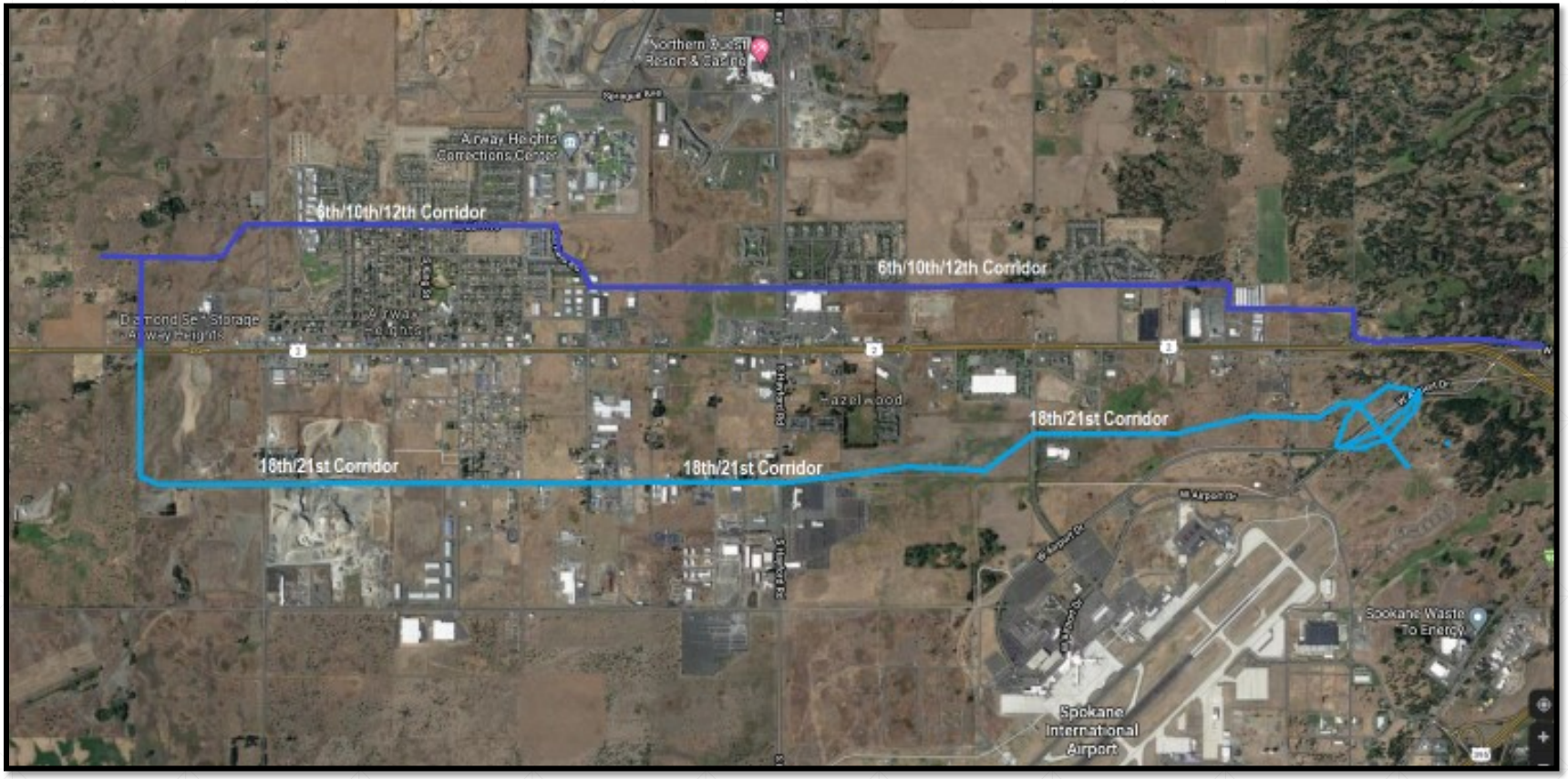
LAND USE		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
1	Ensure development projects provide pedestrian connectivity along US 2	City of Airway Heights/City of Spokane/Spokane County/ with WSDOT Concurrence
2	Partner with broadband providers for both greater connectivity and ITS and CAT possibilities	WSDOT/City of Airway Heights/City of Spokane
3	Consider mixed income transit-orientated development within the City of Airway Heights	STA/City of Airway Heights

Table 7 - Categorized List of Multimodal Practical Solutions Strategies Prioritized by Percentage of Effectiveness (continued)

LAND USE (continued)		
Strategy Order by Percent of Effectiveness	*Practical Solution Strategy*	*Strategy Efforts Led or Provided By*
4	Provide land use zoning that would generate high land use density along US 2 within Airway Heights downtown	City of Airway Heights
5	Facilitate proposed "Complete Street" improvements within the Airway Heights downtown	WSDOT/City of Airway Heights
6	Additional growth in population and employment could be planned with an objective of balancing employment growth with development of housing that is affordable and attractive to people earning the wage levels anticipated in the new employment opportunities.	Spokane Regional Transportation Council (SRTC)/City of Airway Heights/City of Spokane/Kalispel Tribe/Spokane Tribe
7	Support zoning and land use efforts that will enable or promote Transportation Management Systems Operations (TSMO) strategies	City of Airway Heights/S3R 3PDA/City of Spokane/WSDOT
8	Continue coordination with FAFB to mitigate delay at Mitchell St/US 2 by exploring strategies to address storage off of US 2	WSDOT/Fairchild Air Force Base (FAFB)
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

NOTES: Further analysis will continue to be completed in an ongoing collaborative effort, either by; WSDOT or by the respective jurisdiction.
ALL intersection designs will require a traffic study for approval.

Figure 14 - US 2 Parallel Routes Conceptual Plans – 6th/10th/12th and 18th/21st Avenues



Conceptual Rough Drawing Only – Not to Scale – Subject to Change

Table 8 - Traffic Circulation Plan, List of Strategies

Planned Improvements from the Traffic Circulation Plan In & Around US 2 Vicinity	Funded	Planned Improvement - Unfunded
1. Mitchell St/US 2 Signal		X
2. Spoko Fuel Entrance/US 2 - Roundabout	X	
3. Craig Rd/US 2 - Roundabout	X	
4. Loeffler St/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2)		X
5. West St/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2)		X
6. Ziegler St/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2)		X
7. Lundstrom St/US 2 - Roundabout		X
8. King St/US 2 - Right In/Right Out Turn Restrictions (Note: NO Lefts allowed off US 2 at this intersection per City of Airway Heights) Corrected 8-16-21		X
9. Lawson St/US 2 - Roundabout		X
10. Campbell St/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2)		X
11. Russell St/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2)		X
12. Garfield Rd/US 2 - Roundabout		
13. Lyons Rd/US 2 - Roundabout		X
14. Hayden Rd/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2)		X
15. Hazelwood Rd/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2)		X
16. Lucas Rd/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2)		X
17. Technology Blvd/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2)		X
18. Campus Dr/US 2 - Roundabout		X
19. New Road City of Spokane/US 2 - Right In/Right Out Turn Restrictions (Lefts allowed off US 2 - EB only)		X
20. Spotted Rd/US 2 - Roundabout		X
21. Close Sunset Frontage Rd connection to US 2 (Russell Rd will be joined into Sunset Frontage Rd without access to US2 at this location)		X
22. Sunset Frontage Rd/Grove Rd/Airport Dr Intersection - Roundabout		X
23. US 2 Eastbound off ramp onto Airport Drive - Roundabout		X
NOTE: ALL emerging strategies have to be evaluated for prioritization within respective jurisdictions including WSDOT prioritization to compete for State, Regional and Local Funding.		

NOTES: ALL US 2 Approaches/Driveways - Right In/Right Out Turn Restrictions *Future Left Turns off US 2 to be determined only at certain locations.
Right turn restrictions along the US 2 corridor, will be enforced between Rambo Rd and the Sunset Highway connection, determined through the study efforts.
ALL future intersection control is subject to change and requires a traffic intersection study for approval.

Figure 15A - Traffic Circulation Plan - Fairchild Air Force Base to Russell Street

NOTE: ALL future intersection control is subject to change and requires a traffic intersection study for approval.

Figure 15B - Traffic Circulation Plan - Russell Street to west of Flint Road

NOTE: ALL future intersection control is subject to change and requires a traffic intersection study for approval.

Figure 15C - Traffic Circulation Plan - Flint Road to west of Airport Drive Interchange

NOTE: ALL future intersection control is subject to change and requires a traffic intersection study for approval.

APPENDIX

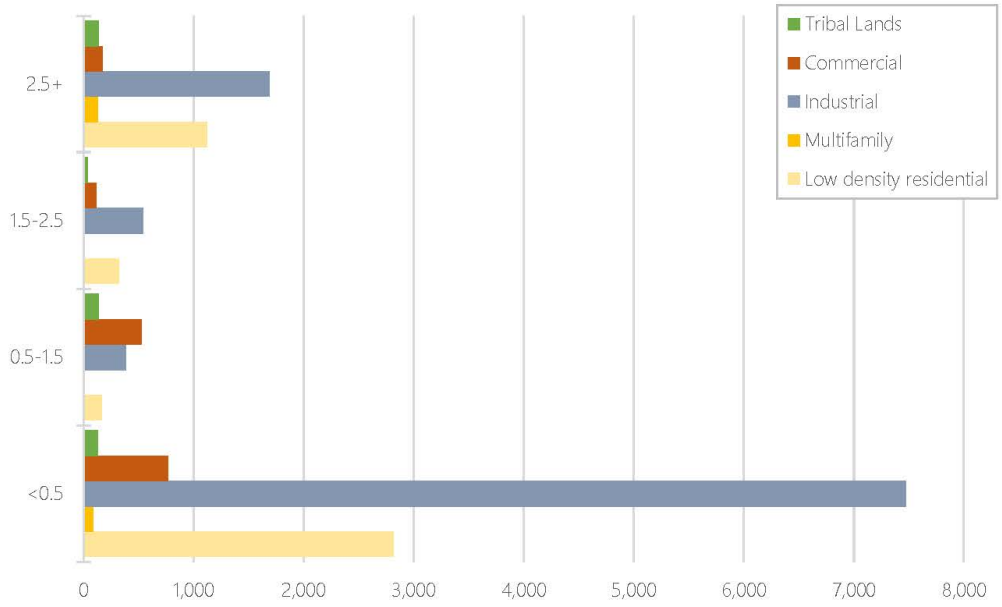
Strengths

- **Substantial Growth.** There has been a recent uptick in growth—particularly with regard to industrial and residential land uses. The rate of growth is expected among stakeholders to continue ramp up.
- **Good Access.** West Plains benefits from access to major transportation networks, rail, and the airport, which is attractive to industrial users, in particular.
- **Industrial Land Supply.** The West Plains area is one of the few places in the entire region where an industrial user can find large tracts (e.g. 15 acres) of industrial-zoned land that can be served by adequate infrastructure.
- **Strengthening Housing Market.** Rapidly increasing housing prices and declining vacancies reflect the growing strength of the housing market. Despite the recent uptick in growth, the rate of construction is still not keeping pace with demand. New units are therefore almost immediately absorbed by the market.
- **Significant Aerospace Cluster.** The region has one of the strongest aerospace manufacturing industry clusters in the nation, with around 240 aerospace-related manufacturing businesses and approximately 8,000 jobs. Significant growth could occur within the next few decades, especially if a large user is successfully attracted to airport land.
- **Strong Workforce.** The area boasts a young, educated workforce and strong workforce development programs in partnership with educational and other institutions throughout the region.
- **Affordable Housing Market.** Housing is cheaper than the rest of the Spokane metro region, although housing prices are increasing. Housing construction cannot keep up with demand, particularly with regard to workforce housing.

Challenges

- Highway 2 is considered "at capacity," with the performance of many key intersections expected to worsen as the rate of growth in the area continues. Potentially troublesome pinch points include Hwy 2 & Hayford, Hwy 2 & Craig.
- **FAA Restrictions.** While Spokane International Airport owns a significant portion of the land in West Plains, it is unlikely to attract small- to medium-sized private developers. Due to FAA regulations, the airport has little choice but to ground lease land to developers. If the airport desires to sell any land, they must go through an extensive, time-consuming process with the FAA. This is likely to deter near- and mid-term development while other, less complicated land is still available in the area. Larger companies—particular aerospace-related—are less likely to be deterred.
- **Restrictive Overlay Zone.** The airport overlay zone impacts allowed development and building types and extends into the surrounding areas where development might otherwise be possible. The zone largely impacts land within the City of Spokane and in unincorporated Spokane County.
- **Adequate Infrastructure** to support high-intensity users is lacking in many places. Additional infrastructure investment—which is understood to be planned—would greatly increase development prospects by providing shovel-ready land and heighten development feasibility for all users, particularly with regard to land to the south of US 2 (in and near Airway Heights).
- **Wetlands** present a barrier to development in some places that must be mitigated prior to new development.
- **Fairchild Air Force Base** may prefer to remain isolated from adjacent development. As such, prospective developers looking to locate projects near the base face challenges on the basis of encroachment.

Figure 7. Acreage by Land Utilization and Zoning



Source: City of Airway Heights, City of Spokane, Spokane County, Leland Consulting Group

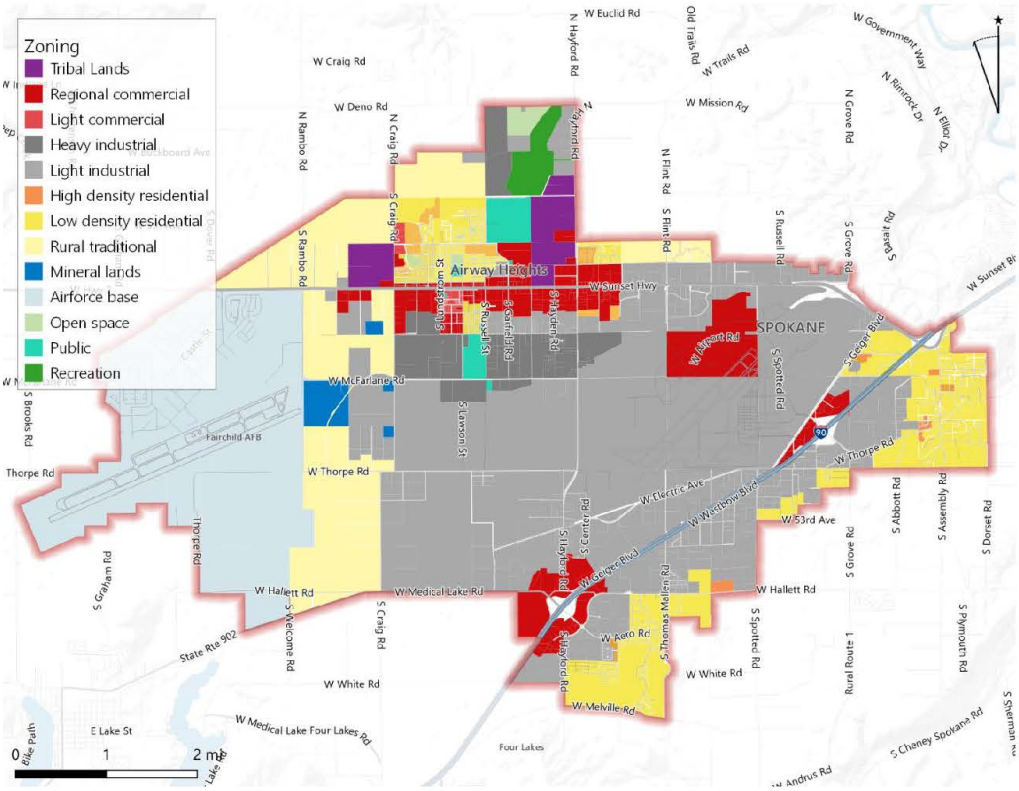
STAKEHOLDER INTERVIEW SUMMARY

Stakeholder interviews are an integral component of the analysis, as they help to ground truth preliminary market findings, identify trends that would not otherwise be seen in more traditional data sources, and highlight the area's nuanced strengths and weaknesses. Stakeholder interviews are especially critical in areas with multiple jurisdictions, significant landowners, and other organizations, such as the West Plains. For example, plans for development on Tribe-owned land or on Spokane International Airport property are likely to register with traditional, market-driven sources of real estate data.

The interviews involved a number of public representatives, namely from Spokane International Airport, the Spokane Tribe, the Kalispel Tribe, Airway Heights, City of Spokane, Spokane Transit Authority (STA), West Plains Public Development Authority (PDA), and West Plains Chamber. Additionally, a significant landowner and two commercial and industrial brokers were interviewed to gain an understanding of markets trends from the perspective of the private sector.

Findings from the interviews, including strengths, challenges, opportunities, and development trends, are summarized as follow. These findings will be carried through the remainder of the memorandum and—where applicable—elaborated. As much of the interview content focused on not-yet-public information, the findings are typically presented as key takeaways and major themes.

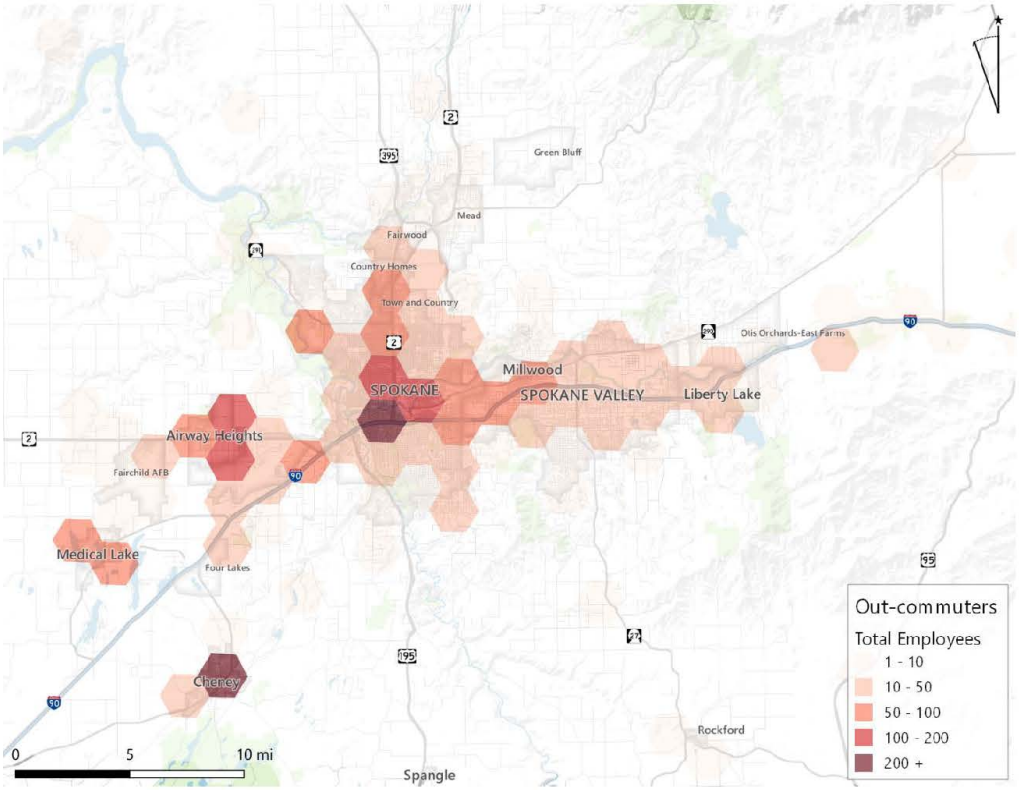
Figure 6. Zoning (Aggregated)



Source: City of Airway Heights, City of Spokane, Spokane County, Leland Consulting Group

The sheer amount of industrial zoned land relative to other zoning is clearly seen in the following graphic, which shows total acreage in West Plains broken down by land utilization and aggregated zoning type. West Plains has an extraordinary amount of highly underutilized land, much of it is zoned for low density residential or industrial uses. That said, much of this land is also found in unincorporated county land where development is likely to be low density and land may lack significant infrastructure. There is significantly less shovel-ready land in West Plains.

Figure 5. Where West Plains Residents Work, 2015



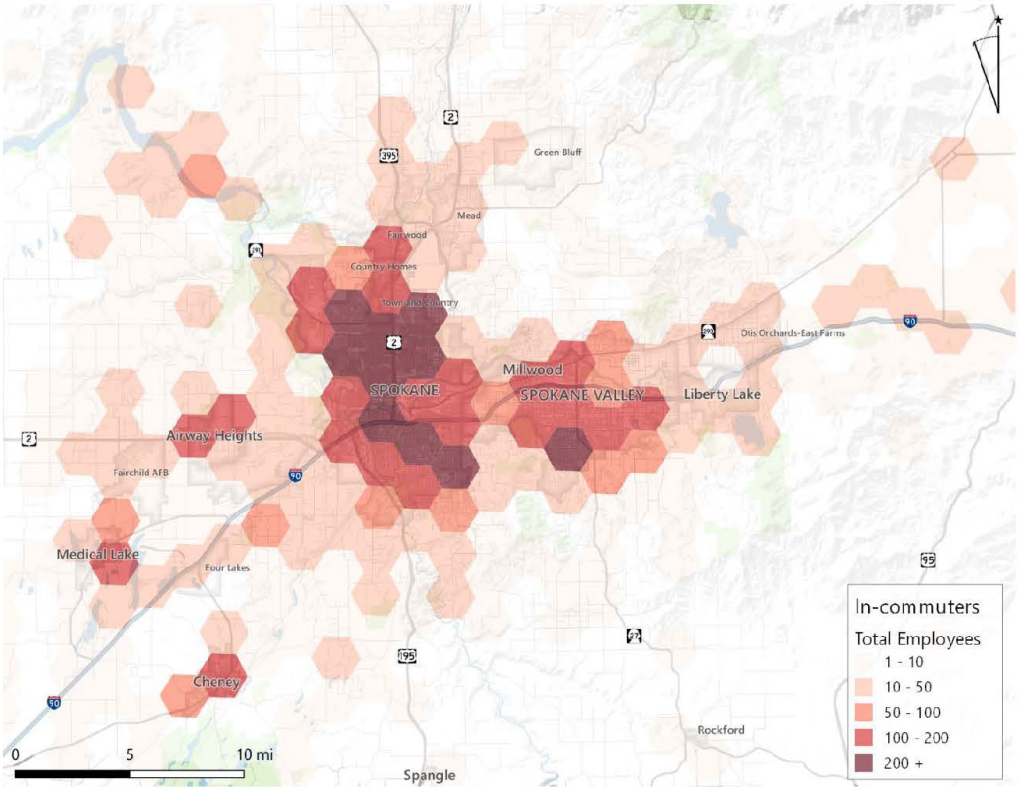
Source: LEHD, Leland Consulting Group

Land Conditions

Cataloging the amount of developable land is critical to a land development Land supply is a critical component of a land development forecast. To this end, land utilization, zoning, and ownership are all important factors.

The following information portrays the aggregated zoning for the entire West Plains study area. These zones were considered when forecasting future development. Light industrial zoned land is the dominant zoning type, largely due to the presence of the airport, which also owns a substantial portion of the land in central West Plains.

Figure 4. Where West Plains Workers Live, 2015



Source: LEHD, Leland Consulting Group

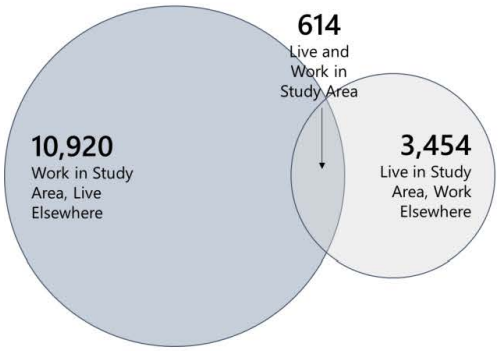
The following map shows the employment location of people living West Plains. The highest concentrations of workers are in Cheney—likely driven by Eastern Washington University, and downtown Spokane—the main office cluster in the metro. West Plain residents also work throughout the rest of the metro, in employment corridors centered around I-90 and US-2. West Plains appears to be a relatively attractive place to live for those working in these areas.

trade and accommodation and food services are both prominent industries and expected to grow as the Tribes develop their land, more housing units are built in the area, and tourism emerges as a prominent sector.

Most significantly, however, manufacturing, transportation and warehousing, professional, scientific, and technical services, and wholesale trade—which collectively account for almost one-fifth of all jobs—are expected to grow at a faster rate the rest of the region. West Plains presents a significant competitive advantage for manufacturing and transportation and warehousing, in particular, both regionally and further afield, and will drive industrial development in the area. Employment growth in the professional, scientific, and technical services industry will drive office demand but the industry is smaller and unlikely to achieve the same rate of growth as more prominent office locations in the Spokane metro, such as downtown Spokane. The Pacific Northwest Tech Park may be one of the few places that well-suited office tenants may locate.

Commute Patterns

Figure 3. Employment Inflow/Outflow, 2015



The figure at left shows—using 2015 data (the latest available)—the number of employees that worked, lived, or both worked and lived in West Plains. Despite a larger geographical area, very few people lived *and* worked in the area in 2015.[2]

The data also shows a significantly higher number of employees than employed residents, demonstrating West Plains' status as a strong employment hub in the region.

Source: LEHD

The past three years has seen significant growth in both residential and employment-based construction, so some of these numbers may have changed. Anecdotally, it is also understood that quality of life, housing quality, and housing availability have all improved in recent years. However, there is likely still an opportunity to provide additional housing that meets the needs and desires of those working in West Plains.

To reinforce this point, the following map shows the home location of people working West Plains. Most people that commute *into* the region for work live further east in Spokane and Spokane Valley. West Plains is unlikely to attract people to live in the area purely based on commute time as the transportation network provides quick cross-metro travel times. Instead, West Plains is challenged with creating a place that offers an attractive mix of housing, recreational and commercial amenities, and high-quality schools[3], among other elements.

[2] Typically, the larger the area, the higher the percentage of employed persons and work and live in the area.
[3] The Cheney School District, which encompasses West Plains and is not seen as attractive relative to other school districts in the Spokane metro region, is considered a barrier to major growth.

Table 3. Household Summary, 2019

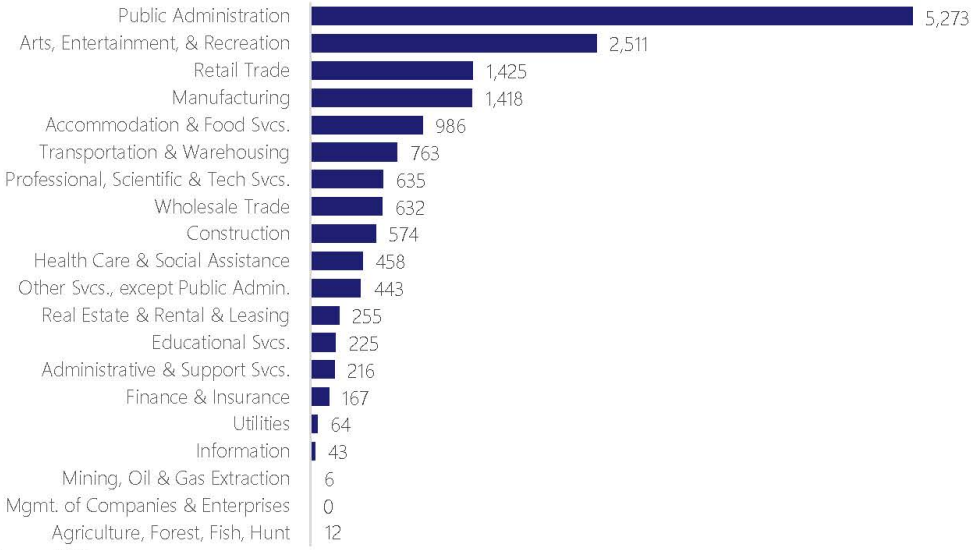
	West Plains	Subregion	Spokane Co	Washington
Avg. Household Size	2.60	2.52	2.48	2.54
1- & 2-Person HHs	57.3%	61.1%	63.5%	61.7%
Med. HH Income	$52,684	$53,338	$56,511	$73,627
Med. Home Val.	$220,970	$250,158	$225,078	$370,055
% Renter Occupied	49%	45%	37%	36%

Source: ESRI

Employment Summary

This section provides an overview of employment and commute patterns in West Plains. The following chart provides a high-level summary of West Plains employment profile.

Figure 2. West Plains Employment Profile, 2018 (est.)



Source: ESRI

The graph shows "public administration" accounting for about one-third of all jobs in West Plains. Public administration encompasses the many public or semi-public agencies or jobs in West Plains, such as the Airway Heights Corrections Facility, Fairchild Air Force Base (military) and Spokane International Airport (notably, security).

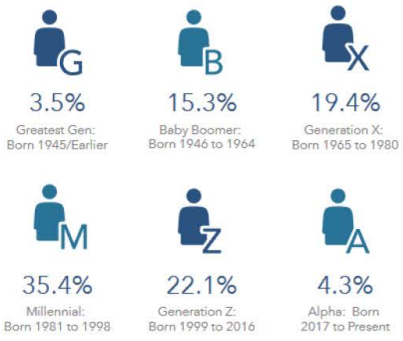
Entertainment and recreation jobs are also very prominent, largely because of the Spokane Tribe Casino and the Northern Quest Resort and Casino. Both these institutions are expected to expand in the near future, so jobs in the art, entertainment, and recreation industry are likely to continue to feature prominently. Similarly, retail

Table 2. Population Age Distribution and Education, 2019

	West Plains	Subregion	Spokane Co	Washington
Median Age	32.3	32.1	38.1	38.6
% Under 18	21.8%	19.6%	21.3%	21.3%
% 18-34	33.3%	34.8%	24.5%	23.5%
% 35-64	35.6%	33.6%	37.9%	39.1%
% 65+	9.3%	12.0%	16.3%	16.1%
% with bachelor's degree	19.8%	28.6%	31.1%	36.0%

Source: ESRI

The following graphic provides a more detailed breakdown of the West Plains population by generation. Different generations typically share similar lifestyle preferences and trends. This is particularly true for housing, recreation, and amenities. People belonging to the Millennial and Boomer generations typically place the highest demand for multifamily housing and affordable, smaller single-family homes (including townhomes and small single-family structures). Generation Xers, of which West Plains has a significant population, typically drives demand for larger "move-up" single-family homes. Generation Z—largely the children of older Millennials and Gen Xers—are likely to either move out of the area for college or enter the local workforce. Gen Z preferences remain open-ended, but it is likely that they will continue to drive demand for multifamily and, more selectively, student housing.



According to data from the Washington Office of Financial Management, Spokane County is projected to experience major population growth in Baby Boomer and Millennial generations over the next 10 years.

The stakeholder interviews conducted for this analysis—summarized in more detail later in the report—highlighted substantial projected growth for the Cheney School District. This data would appear to support that notion, with Alpha's (the newest, youngest generation) already totaling more than four percent of the total population, despite only being born in the last two to three years.

The following table shows a range of housing characteristics, hightling the high proportion of rental housing in West Plains, despite the fact that the area has not historically been a hotbed of apartment construction. Indeed, the fact that West Plains also has the highest average household size of other comparison areas appears to reflect the single-family nature of the housing market. Along with the previous data showing West Plains' significantly younger population, this appears to suggest young families living in rented single-family homes, perhaps driven by the presence of larger institutions like Fairchild Air Force Base.

EXISTING CONDITIONS ANALYSIS

This section presents demographic and employment conditions for the study area and surrounding region, as well as high-level assessment of land supply conditions in the study area.

Demographic Summary

The data provided in this section pertains to West Plains, Spokane County, and the State of Washington. Also included is the "subregion," referring to the area generally defined by the West Plains study area, Medical Lake, Cheney, Four Lakes, and Cheney Spokane Road—roughly a 7.5-mile radius around the 902/I-90 interchange. This subregion represents the residential market area, reflecting the area that shares similar characteristics with the West Plains study area and from which most competitive development will originate.

The following table shows population trends over the past 18 years. The West Plains study area has seen higher-than-average growth compared to the wider region, county, and state. It is important to note that although the data shows a 2.2 percent compound annual growth rate in West Plains' population from 2010 to 2019, the last year saw almost 4.8 percent growth, highlighting the rapid increase in the rate of growth in very recent years. West Plains' existing employment focus is highly apparent, as the only area showing more workers than residents for "daytime population."

Also significant is the proportion of the population in group quarters (17.5 percent), reflecting the presence of the Airway Heights Correctional Facility.

Table 1. Population Summary, 2000-2019

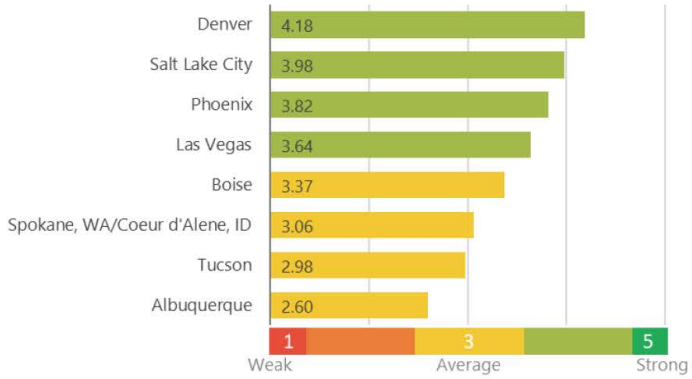
Population	West Plains	Subregion	Spokane Co.	Washington
2000 Total	12,418	33,815	417,939	5,894,121
2010 Total	14,344	40,313	471,221	6,724,540
2019 Total	17,415	46,033	515,061	7,608,571
00-19 CAGR	1.90%	1.73%	1.17%	1.43%
10-19 CAGR	2.18%	1.67%	1.12%	1.56%
2019 Daytime Pop	22,749	47,883	524,440	7,526,959
Workers	13,892	23,648	238,181	3,701,657
Residents	8,857	24,235	286,259	3,825,302
% In Group Quarters ('19)	17.5%	11.5%	2.9%	2.0%

Source: ESRI

The following table shows age distribution and the percent of the population aged 25 and over that have a bachelor's degree or higher. This part of the Spokane metro region is significantly younger than the rest, with an average age of only 32.1 versus 38.1 for the county. Most significantly, well in excess of half the population is under 35 years old. A smaller proportion of seniors (aged 65 and over) is potentially indicative of the area's employment-heavy focus and isolation from the rest of the Spokane metro, where a greater array of transit options, amenities, services, and housing is more accessible.

REGIONAL CONTEXT

In recent years, the Spokane metropolitan regional market has not been considered a hotbed of investment. Indeed, Spokane ranked 64th out of the 79 markets identified by the Urban Land Institute (ULI) in its annual "Emerging Trends in Real Estate" publication. This score is based on participants' opinions on the strength of the local economy, investor demand, capital availability, development and redevelopment opportunities, public/private investments, and the local development community.



Generally, however, ULI maintains that the Mountain region will "continue to exhibit strong demographic and economic growth," and the "comparatively low cost of living and [cost] of doing business is considered attractive to new residents and conducive to employment growth." Indeed, the Spokane metro region has added population and jobs faster than the USA average, although income growth is expected to grow at a slower rate.

Emerging Trends also advises on the types of development that are likely to be most desirable in the coming years from both a developer and investor perspective. While this is a national outlook, the guidance is relevant for most local markets, including West Plains and the greater Spokane region.

The figure below shows ULI's high-level summary of national investment and development prospects for 2019. Industrial and housing top the list, with office, hotels, and retails falling somewhat far behind. Industrial and distribution uses have become increasingly popular investments in recent years, largely due to the rapid rise of ecommerce.

Focus groups conducted by ULI for the Spokane/Coeur d'Alene region report that their metro could benefit from increased infrastructure investment, and that they continue to see rising interest from national and regional investors.

However, like most cities across the nation, Spokane is experiencing significant issues with a shortage of construction labor and higher construction costs, which is amplified locally by stagnant rent growth.

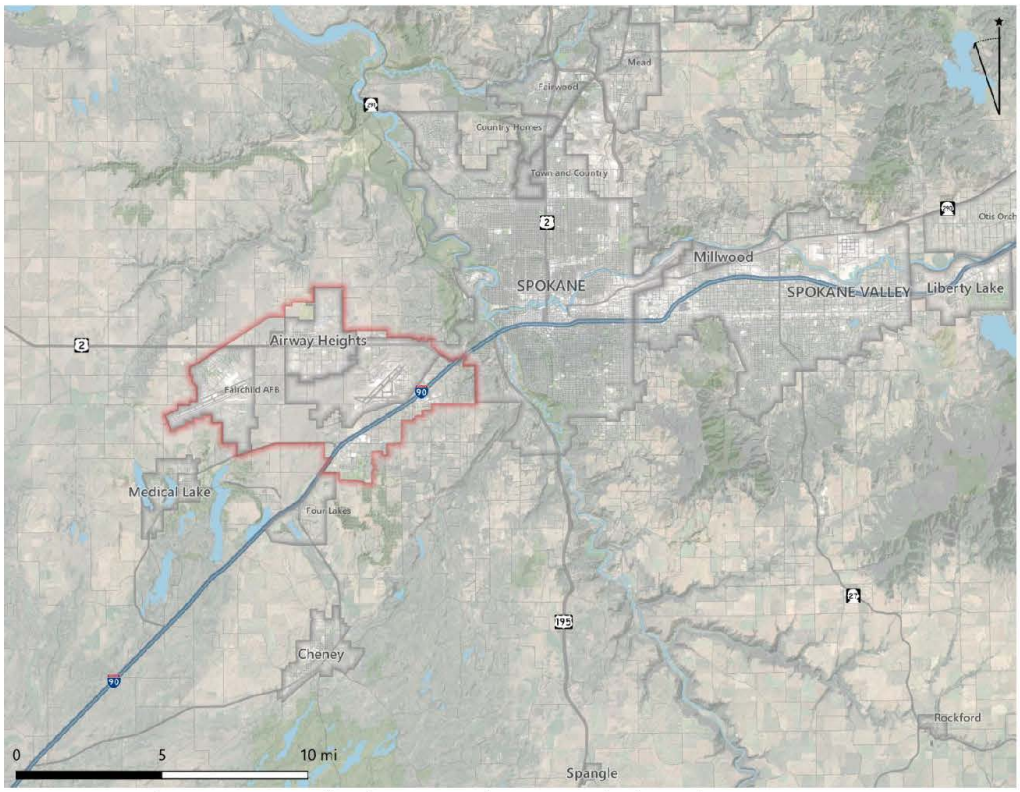
culminates with the characterization of long-term growth potential and expected development types for each expected land use in the study area.

Related to many, if not all, components of this market research are a series of stakeholder interviews. Stakeholder interviews are critical in building a basic understanding of development trends, the area's strengths and weaknesses, expected development projects, as well as how the area might change as a direct result of infrastructure investment. This memorandum includes a summary of these interviews.

West Plains Study Area

West Plains is located on the western edge of the Spokane metro region in Spokane County, Washington, centered around Highway 2 and Interstate 90. Fairchild Air Force Base, the City of Airway Heights, the City of Spokane, the Kalispel Tribe, the Spokane Tribe, Spokane County, and Spokane International Airport are all prominent stakeholders. With few cities or town to the west, and only the cities of Medical Lake and Cheney nearby to the south, West Plains has a substantial trade area which is unique to the rest of the Spokane metro region.

Figure 1. West Plains Study Area and Regional Context



Source: TIGER, Spokane County, State of Washington, Google (imagery), Leland Consulting Group

Attachment A. Market Analysis Findings

LELAND CONSULTING GROUP

Market Analysis and Development Forecast

Date August 21, 2019

To Kara Hall, Don Samdahl
Fehr & Peers

From Sam Brookham, Chris Zahas
Leland Consulting Group

Subject Market Analysis and Development Forecast

Project West Plains Transportation Management Plan

INTRODUCTION AND PURPOSE

Project Overview

The US 2 West Plains Subarea Management Plan refines previous studies that have been completed in the West Plains area. Previous studies have indicated performance concerns mobility gaps (congestion) for the US 2 corridor in Airway Heights, as well as a need for a local parallel roadway network. This study addresses the mobility gaps along US 2 between the US 2 & I-90 interchange and Fairchild Air Force Base entrance. This study also looks at other possible parallel frontage road connections for 6th/12th and 18th/21st, to help alleviate traffic loading directly onto the US 2 corridor.

In recent years, land use developments in the West Plains area has been growing at a fast pace. There is a need to understand the land use growth and the impacts it will have on the transportation system, so we can plan accordingly. This transportation-focused study will help position the West Plains for continued growth, prioritize improvements and maximize return on investments, secure scarce funding, and plan for dedication of needed right-of-way.[1]

Economic Analysis

This economic analysis is aimed to help WSDOT better understand the future development potential of the study area for residential, commercial, and industrial uses by providing data relating to new jobs and residents to populate new traffic models based on realistic development trends in the area.

A market-based development forecast for the next 20 years summarizes future conditions by identifying net new development on vacant and underutilized sites. While the analysis is largely undertaken at the parcel-level, the development forecast is aggregated into TAZ shapefiles to populate traffic models.

The forecast is informed by a market analysis, which includes an assessment of current and future demographic conditions, land use conditions, real estate dynamics, and West Plains strengths and weakness. The analysis

[1] From WSDOT Project Home Page, URL

To validate the trip generation for the primary land uses within the study area five dynamic tests will be performed to establish model trip generation rates. The five tests completed for a TAZ containing each of the land uses below include:

- Add 100 single family dwelling units
- Add 100 multifamily dwelling units
- Add 100 non-CDB retail employees
- Add 100 office employees
- Add 100 industrial employees

The PM peak hour trips generated before adding the test land uses will then be compared to the PM peak hour trips generated after adding the test land uses to verify the trip rates assumed in the travel demand model for each land use type. These rates will be compared to trip generation rates found in the current Institute of Transportation Engineers (ITE) manual and summarized as part of the effort described above.

Through this process a proposed multiplier will be identified for each of the land use types. This multiplier will then be applied to the appropriate land use types for each TAZ in the study area. Through an iterative process, the trips generated with the proposed multiplier will be compared to the expected generation. This process will need to be iterated until it is determined that the trips generated from the travel demand model and the expected trip generation rates are within an acceptable threshold (approximately +/- 10%).

Once the land use multipliers result in a trip generation that is within 10% of the expected trip generation, the factored land uses will be used to develop traffic forecasts for 2040.

study for similar fulfillment centers was completed as part of the TIA for Project Rose, which resulted in an expected trip generation for the Project Rose site of 1.25 trips/1,000 square feet (KSF) or 0.90 trips per employee.

The typical trip generation rate per employee for industrial uses is 0.49 trips per employee, approximately half of what was measured at a similar facility. While development associated with the Amazon Distribution Center was considered in the market analysis described above, to account for the higher trip generation expected from this site, the number of employees included in the land use inputs for the model were factored up. The number of trips expected from the Amazon Distribution Center, trip generation rates, and land use inputs are summarized in **Attachment C**.

Spokane International Airport

Two factors are expected to contribute to growth in the area controlled by Spokane International Airport. The first is continued growth in operations at Spokane International Airport, including the future addition of a third runway. The second factor is growth in development on land around the airport, which is expected to be developed by a mix of commercial and industrial uses. Development expected to occur over the next 20 years in the area surrounding the airport was considered in the market analysis described above; however, growth associated with airport operations was considered separately.

The best available metric to estimate growth associated with airport operations was determined to be the number of enplanements. The number of enplanements in 2015 was used to establish a baseline along with employment data. Using the number of enplanements and the number of employees, determined using On the Map Census data, a baseline number of employees per enplanement was established. Using the number of employees per enplanement and the forecasts for 2030 enplanements from the Spokane International Airport Master Plan a future number of employees was calculated. Calculations for the airport land use are summarized in **Attachment D**.

Traffic Forecasting Approach

This section describes how the results of the land use analysis and trip generation calculations described above are planned to be incorporated by WSDOT into the regional travel demand model for the West Planes area.

The first step in the future land use updates for the 2040 travel demand model is validating the trip generation step of the model within the study area.

This statement provides information on the number of Active Duty, National Guard, and Reserve members stationed at FAFB. Information on the number of civilians and total personal were also provided in this information.

Recent and planned growth information for FAFB was based on the best available information provided to the project team. Available information indicated that 200 additional Active Duty Airmen were recently stationed at FAFB and future growth plans include the addition of 600 more Active Duty Airmen.

To develop a conservative estimate of future growth, it was assumed that as additional Airmen were added the total personnel on base would also increase proportionally. As a result, ratios between Active Duty Airmen and all other personal groups were assumed to remain constant with future growth.

To establish a current baseline, the 200 Active Duty Airmen were added to the 2016 personnel. All other personnel were increased proportionally to represent a 2018 baseline. To develop projected numbers to be utilized in the trip generation analysis, an additional 600 Airmen were then added to the baseline numbers with respective growth across all base personnel. Current and projected employment numbers for FAFB are summarized in **Attachment B**.

To develop a trip generation rate for FAFB traffic counts collected in 2018 at the US 2 and Mitchell Street, which serves as the primary access point for the base, along with the 2018 employment data were utilized to develop a trip per employee rate.

The current trip rate during the PM peak hour was found to be 0.10 trips per employee. As this land use is identified as a Special Generator and does not align with any of the land use categories within the travel demand model, this trip rate was used to determine the number of employees that should be added to the travel demand model to best replicate the expected trip generation from FAFB based on future growth. The final model land use inputs are included in the West Plains Trip Generation.xlsx included as **Attachment C** to this memorandum.

Amazon Distribution Center

Information for the Amazon Distribution Center is documented in the *Project Rose Traffic Impact Analysis* (May, 2018). As noted in the TIA completed for the project, the proposed distribution center will provide 2,560,000 square feet of warehousing and distribution. Amazon Distribution Centers tend to generate a much higher trip rate than typical warehousing uses. A trip generation

Trip Generation Rates

The expected PM peak hour vehicle trip generation estimates were developed using the number of employees expected, number of single-family dwelling units (SFDUs) and multi-family dwelling units (MFDUs) expected, and trip generation rates from the *Institute of Traffic Engineers (ITE) Trip Generation Manual, 10th Edition*. Trip rates per employee were used for retail, industrial, and commercial land uses, while trip rates per dwelling unit for SFDU and MFDU were used for residential land uses.

The study area includes a number of land uses that were identified as "Special Generators". These uses include Fairchild Air Force Base (FAFB), Spokane International Airport (SIA), and the Amazon Distribution Center. Trip generation estimates for these land uses were developed separately due to limited land use information and expected differences from standard ITE trip generation rates. Special generators are described in detail below.

Market-Based Analysis

An independent market-based development forecast was completed to identify net new development estimates on vacant and under-utilized sites. The documentation and findings from that study are included as **Attachment A** to this memorandum**.** The market analysis forecasts growth expected to occur within the West Plains over the next 20-years and serves as the baseline for the 2040 land use inputs.

Special Generators

There were several locations within the study area where Special Generator land use estimates were needed. These occurred in two situations: (1) locations where limited information was available regarding future land use plans, and (2) where the identified land uses were not expected to generate trips consistent with rates documented in the ITE Trip Generation Manual. These areas and land uses were identified as Special Generators, for which land use estimates and trip generation rates were developed using the methodologies described below.

Fairchild Air Force Base

Land use and trip generation estimates for FAFB were developed using the best available information provided by Air Force representatives on the Technical Advisory Committee. For future land use and employee estimates, an existing baseline was established using the 2016 Fiscal Statement for FAFB.

FEHR PEERS

Table 1. Final Land Use Growth Forecasts for 2040

TAZ	No. of Dwelling Units		No. of Employees									
	SFDU	MFDU	CBD RETAIL	FIRES	HOTELS	INDUSTRIAL	MEDICAL	OFFICE	EDUCATION EMPLOYEES	Non CBD Retail	STUDENTS UNIVERSITY	UNIVERSITY EMPLOYEES
459	773	773	0	3	0	0	3	0	35	10	0	0
460	0	0	0	0	0	150	0	0	0	0	0	0
461	164	0	0	0	5	0	0	251	0	6	0	0
462	263	400	0	3	0	333	3	2	0	45	0	0
463	0	0	0	0	61	0	0	201	0	52	0	0
464	0	0	0	4	0	475	0	90	0	42	0	0
546	0	0	0	5	0	0	3	0	0	0	0	0
547	0	0	0	0	0	0	0	0	0	0	0	0
549	0	0	0	13	0	6	2	344	3	238	0	0
550	0	0	0	60	0	772	50	815	0	155	0	0
551	0	0	0	0	129	4084	0	145	0	401	0	0
552	0	0	0	61	62	299	0	0	15	45	0	0
553	567	224	0	0	1	179	0	34	0	59	0	0
556	34	0	0	0	0	173	0	2	0	135	0	0
558	159	163	0	0	0	1500	0	0	0	0	0	0
559	442	340	0	0	25	283	0	8	0	14	0	0
579	147	0	0	1	0	0	0	0	0	0	0	0

FEHR PEERS

MEMORANDUM

Date: June 26, 2020 (Revised March 9, 2021)

To: Bonnie Gow, *Washington State Department of Transportation*

From: Kara Hall and Don Samdahl

Subject: West Plains Sub Area Land Use & Trip Generation Methodology - REVISED

SE18-0645

March 2021 Revisions

This memorandum has been updated to reflect the final land use growth forecast for the West Plains as of March 2021. This update reflects comments provided by Washington State Department of Transportation (WSDOT) and City of Spokane following completion of the market analysis. The land use information presented in **Table 1** is the final land use used for the West Plains Study and other regional studies, including the US 195/I-90 Transportation Study. **Table 1** shows the land use growth forecast to occur by 2040 within the West Plains study area. All comments received and changes made to the land use inputs are documented in the final West Plains Trip Generation Spreadsheet provided to WSDOT in February 2021.

Introduction

WSDOT is leading a study to evaluate the future needs of the transportation system in the West Plains. To understand future traffic volume based on land use growth in the area, WSDOT will use the regional travel demand model developed by Spokane Regional Transportation Council (SRTC).

As part of this study, WSDOT will update the future year land use in the travel demand model based on the land use inputs summarized below. This memorandum also documents the process for validating future trip generation rates based on land use inputs. This is an important step in confirming that the regional travel demand model is forecasting the appropriate amount of growth based on industry standard trip generation rates.

D. Spokane International Airport Operations Projected Growth				
2015 Census Data		Enplanements		
Employment Sector	Jobs	2015 Enplanements	2030 Enplanements	2030 Projected Employees
Manufacturing	6	3.30E-06	-	10
Retail Trade	31	1.70E-05	-	53
Transportation and Warehousing	431	2.37E-04	-	739
Information	14	7.69E-06	-	24
Real Estate Rental and Leasing	96	5.27E-05	-	165
Professional Scientific and Technical Ser	20	1.10E-05	-	34
Admin & Support	78	4.29E-05	-	134
Educational Services	66	3.63E-05	-	113
Accommodation and Food Services	165	9.07E-05	-	283
Total	**907**	**1,820,148**	**3,119,876**	**1,555**

B. FAFB Build Out Land Use				
2016 Fiscal Statement		Ratios	Current	Projected
Active Duty	2828	-	3028	3628
Washington Air National Guard	947	0.33	1014	1215
Army Nation Guard/Army Reserve	685	0.24	733	879
Total Military	**4,460**	**1.58**	**4,775**	**5,722**
General Schedule	611	0.22	654	784
Federal Wage System	94	0.03	101	121
Defense Commisary Agency	58	0.02	62	74
Non-Appropriated Fund Civilians	221	0.08	237	284
Contract Civilians	363	0.13	389	466
AAFES Civilians	103	0.04	110	132
Branch Banks/Credit Union Civilians	10	0.00	11	13
Other Civilian Vendors	15	0.01	16	19
Total Civilians	**1,475**	**0.52**	**1,579**	**1,892**
Total Dependants	**5,935**	**2.10**	**6,355**	**7,614**
Total Personal	**11,870**	**4.20**	**12,709**	**15,228**

Current Estimates = 2016 Economic Impact Statement + 200 Airmen added recently.
Projected Estimates = Current + 600 Airmen planned to be added.

Table 5. Typical Space Utilization Per Job

Land Use	Sq. Ft./ Emp	Rationale
Industrial	1,000	EIA recommends 1,500 square feet (sf) for warehouse, using 2012 data, while Energy Star estimates 1,700 sf. Building Owners and Managers Association (BOMA) recommends 469 sf per employee for industrial (primarily manufacturing). Snohomish County's 2007 employment density study estimated 1,000 for wholesale, transportation, and utilities (WTU), and 500 for manufacturing. With industrial development expected to largely mostly WTU and warehousing, we expect a marginally higher-than-average employment density metric of 900 to 1,100 sf.
Office	350	EIA recommends 600 sf per office job, and 550 for medical offices. However, EIA uses 2012 data and new research (C&W, URL) indicates office space utilization trending towards 180 sf. BOMA, as of 2018, also recommends 288 sf per worker for private sector office buildings. Several other planning agencies have documented 250 sf for traditional office, 350 for R&D or flex, and 400 for medical office. For the West Plains area, where office space is likely to be limited to land uses that require more space, such as flex buildings, medical offices, and secondary office buildings (i.e. in support of other industries, like construction), employment density is likely marginally lower than the BOMA and broker numbers, which would apply mostly to established urban office locations.
Retail	600	Retail development can be either food service establishments strip/big box retail, or others, each of which have different employment densities. Regional planning entities have these ranging from 200 sf for food service, to 600 or more for traditional mercantile retail, and 1,000 for a supermarket. EIA estimates are high, at 920 sf for traditional retail and 567 for food service but reflect the range of metrics presented by different entities. Retail in West Plains is likely to be predominantly traditional mercantile, so an upper range of 600 is reasonable.
Hotel	2,500	EIA's estimates for hotel employment density is approximately 2,500 sf. While the data is from 2012, there have been few changes in the manner in which hotels operate over the past decade, so it is reasonable to assume this information still rings true. More recent data provided by Energy Star also uses a ratio of 0.32 workers per 1,000 sf, the equivalent of about one employee per 2,500 sf (URL).
Self-Storage	25,000	Self-storage typically only employs a full-time attendant and one or two others due to its hands-off and often automated nature. This is reflected in the fact that it is one of the lowest employment generators across all land uses.
Other/ Misc.	600	For properties that do not necessarily fit within the above categories, such as entertainment uses associated with the casino and/or others, are likely to follow a similar trend to retail.

Source: Leland Consulting Group

[a] Mullen Technologies Inc. planned development for 500,000 square foot manufacturing plant adjacent to the planned Transload Facility employing around 800 people (625 sq. ft. per employee). An additional 800,000 (1.3 total) square feet and 2,200 jobs (3,000 total) may be possible with a potential lithium battery R&D and production facility (potential expansion, not planned). Only the first, known phase of development is included in this analysis.

[b] Includes known 2.6m sq. ft. Amazon facility, set to employ between 1,500 and 1,800 employees, with seasonal influxes up to 2,300 (model uses an average of 2,000 employees—an equivalent of 1,300 sq. ft. per employee).

[c] Job density calculations are used for speculative development only. That is, for large planned and under construction projects—such as Kenworth Trucking, Amazon, Mullen Technologies, etc.—this job data is added directly to the model, rather than as an employment density calculation. That said, it is expected that, cumulatively, new development will largely follow industry standards.

[d] This employment forecast is significantly higher than most employment projections sources indicate. That is because these projections are typically based on historical averages and high-level trends. This analysis, on the other hand, blends market research and analysis with a detailed understanding of the development pipeline, highlighting several substantial projects that do not abide by typical market dynamics (for example, a market analysis cannot provide guidance on whether a development as large as Amazon will occur because there are far more important elements at play, nor can it indicate significant growth in government institutions, such as Fairchild Air Force Base).

e Assumes additional development beyond the office demand presented in the previous section due to demand for flex space.

Employment Density

Existing employment at a specific site can be known with certainty. But often, industry averages serve as a starting point for communities planning future land use. Several institutions have research on the average square feet typically utilized by employees for different land uses. These include the Building Owners and Managers Association (BOMA), the U.S. Energy Information Administration (EIA), commercial brokers, and local governments that have conducted surveys of commercial buildings to identify space utilization averages for specific building types or industries. The variability of the data is typically broad, so a certain level of customization is required depending on anticipated land uses. For example, big box retail and warehouse industrial or high tech industrial data centers will have fewer employees per square foot than food-service retail and manufacturing industrial. Total employment generation for known development projects in the region also help ground truth some of these density assumptions.

The following table provides an explanation of the rationale behind the employment density used in the development forecast.

Development Forecast Summary

In order to populate traffic models, these site-specific development projections are packaged into areas called traffic analysis zones (TAZ). Development projections for each land use in each TAZ are presented in the following table. Basic metrics (such as average square feet per employee for each land use and people per household) are provided to show estimated job generation and population growth. For industrial job generation, we assume a lower density to reflect the propensity of new industrial to be largely tied to logistics, warehousing, and distribution. Additional manufacturing jobs—particularly aerospace-related—would be expected to be higher density. Several additional notes are provided below the table.

Table 4. Market-based Development Forecast, 2019-2040

TAZ Number	Housing Units	Industrial	Office	Retail	Hotel	Storage	Other/ Misc.[4]
459	1,098			25,744			
460		500,000[a]					
461							150,000
462	567	118,021					
463				120,000	100,000		120,000
464	241	475,060	31,494	105,851			
546	249						
547	78	201,705		120,160		368,015	
549							
550	204	769,416	285,274	387,629		64,040	
551		3,520,215[b]		407,460	63,824	38,021	
552		298,916		113,555	104,361		
553	791	177,829	12,000	146,362			
556				295,206			
558	8						
559	897	201,979					
579	147						
Total Dev't.	4,274	6,263,141	328,768 [e]	1,721,967	268,185	470,076	270,000
Est. Employees[5]		8,563[c]	939	2,870	107	19	450
Est. Pop (2.60/HH)	11,112	Total Est. Employment: 12,949[d]					

Source: Leland Consulting Group

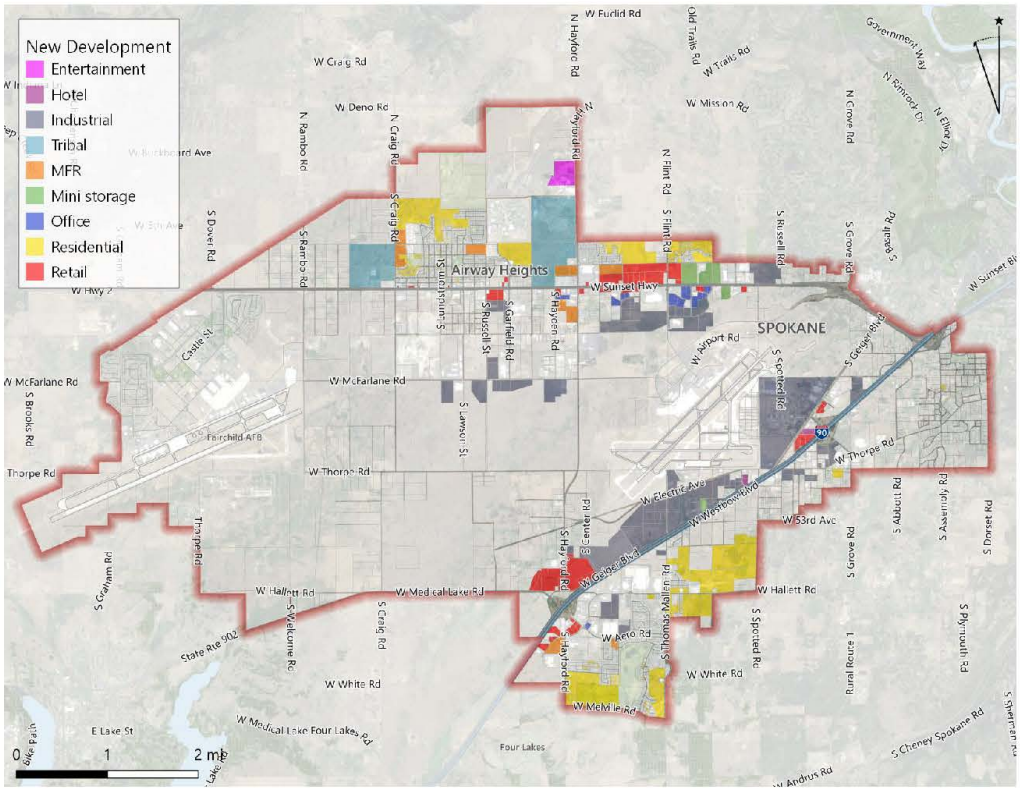
[4] "Other/Misc." here refers to non-specific commercial uses associated with the potential development on Tribal Lands, which may include hotel(s), entertainment uses, retail, etc.

[5] These employment projections are calculated using a combination of direct employment inputs for planned and under construction projects with known project details and estimated forecasts for projected development using average industry standards for square footage per job (the rationale for which is provided on the following page).

- The **office** market is limited and is unlikely to see the same uptick in development activity as residential and industrial. Some data points to a handful of small- and medium-sized office projects on or near existing business parks to the north and east of the airport. The development forecast summary table, below, presents about 90,000 additional square feet of office space than the demand forecast in the previous section identified. This is to be considered a "buffer" that would largely be accommodated by flex development, although flex space is likely to assume a larger market share than 90,000 square feet over the next 20 years.
- **Significant infrastructure investment** is required to increase the development capacity of the West Plains, particularly in order to attract high-intensity industrial users. Water remains an issue to be addressed, especially in Airway Heights, and improvements to the transportation network have highlighted as necessary for the area's continued development. With an understanding that there are plans for major infrastructure, this investment would greatly increase development prospects by helping to prepare shovel-ready land and heighten development feasibility for all users, particularly with regard to land to the south of Hwy 2 (in and near Airway Heights).

These site-specific development projections are presented in the following map.

Figure 13. Anticipated New Development, 2019-2040



Source: Leland Consulting Group

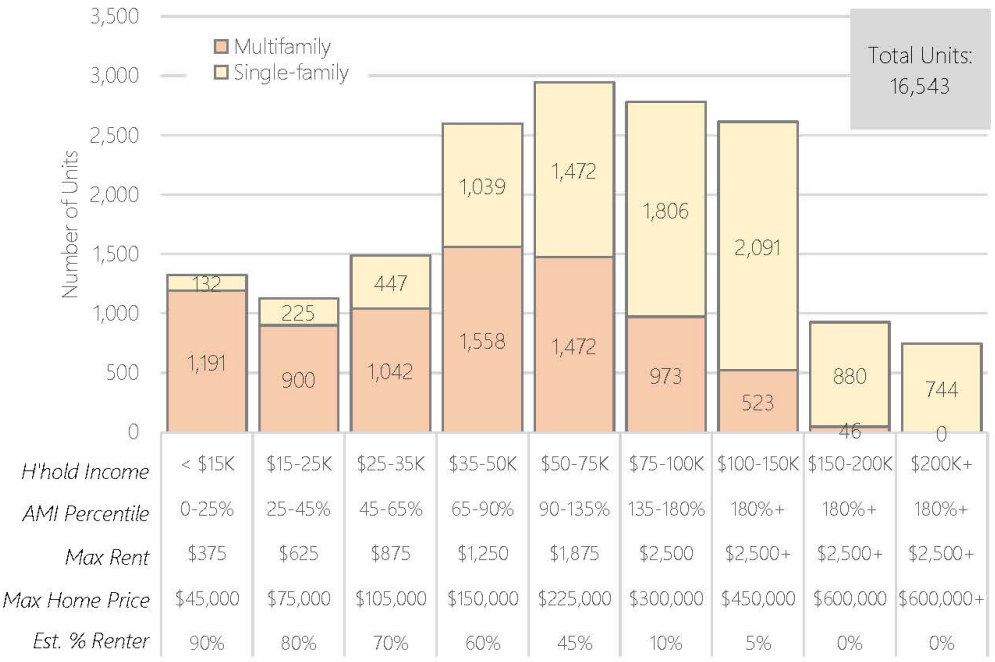
DEVELOPMENT PROGRAM

This section describes total predicted new development, based on known projects, land supply analysis, planning documents, and general development trends in the area, among other elements. The development forecast applies the findings from the market analysis to the West Plains study area at the parcel level, highlighting potential development opportunities on a site-by-site basis.

Generally, the Hwy 2 (City of Spokane segment) and I-90 corridors are likely to see the most development activity based on current development trends, existing infrastructure capacity, and a number of planned projects providing impetus to the market. Key takeaways, including phasing notes, additional rationale, and other findings relating to each development type are discussed below.

- For **industrial**, development to the south of the airport is likely to follow in Amazon's footsteps. New infrastructure investments and access to high quality transportation networks make this area particularly attractive to transportation, distribution, and warehousing companies. The new Geiger Rail Spur and planned transload facility will also improve prospects for industrial users, like manufacturers, for the area surrounding McFarlane Road, although much of this land is owned by the airport. The remaining areas likely to see additional industrial development are the Pacific Northwest Tech Park, the area south of Triumph, and the airport business. These areas are served by existing infrastructure and transportation networks and development interest have recently peaked.
- **Development of airport-owned land** is challenging to forecast for a number of reasons. There is a concerted effort to attract large companies to the area that are tied to the aerospace industry, but these rarely follow regular market dynamics. We understand that talks are underway with a number of companies but may not necessarily result in new development projects. Another complication for airport-owned land are the FAA regulations that restrict the sale of the land for private development, which is to be considered a barrier to development. If the PDA and airport's economic development efforts are successful in attracting a number of large companies to the area, full build-out numbers are more likely to apply (development would likely impact TAZ 460, 546, and potentially 551). The aforementioned transload facility will likely increase the appeal of this land to these companies.
- For **residential**, development activity is largely expected in Airway Heights, on Kalispel Tribal land, and south of I-90. Single-family residential will continue to be highly sought after, particular homes in the $200,000 to $300,000 range that give West Plains a competitive advantage over its neighboring area. Continued residential construction of lots in the County south of I-90 and outside the overlay zone is expected, adding significant residential activity to the area and supporting retail demand. Substantial residential activity is also planned for the Kalispel Tribal land, which will capitalize on the high demand for multifamily units. Airway Heights' residential areas to the north of Hwy 2 will likely continue to see residential construction until full build-out is achieved, likely before the 2040 planning horizon. At which point, increasing the availability of buildable residential land through rezoning or annexation may be needed; the strength of the housing market is likely to support almost all additional development.
- For **retail**, there are a few areas identified for significant retail development, largely based on available land, suitable zoning, visibility and access. These include eastern Airway Heights and further along US-2 (near the proposed North 40 outfitters), as well as surrounding each of the I-90 interchanges. Retail is currently challenging on industrially zoned land in the City of Spokane and Spokane County within the airport overlay zone. Commercial developments and expansions of existing property (potentially including retail, hotel, and other entertainment uses) are also expected on both Kalispel and Spokane Tribal Lands.

Figure 12. Residential Demand, Residential Market Area, New Units, 2019-2040



Office and Industrial Demand

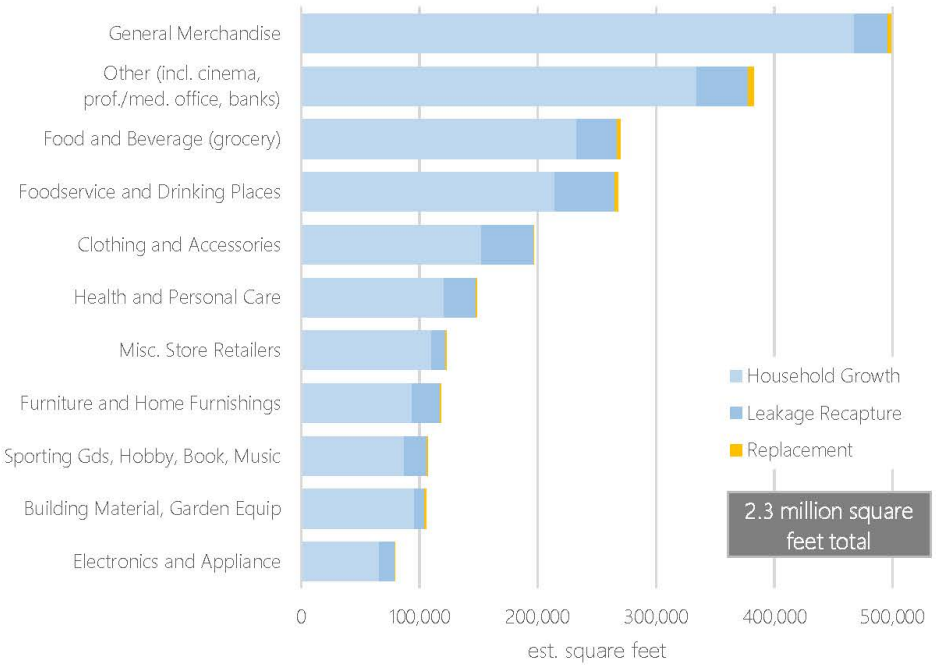
Primary drivers of demand are likely to remain industrial-oriented, particularly with Amazon's new facility creating additional interest for associated warehousing and distribution. Aerospace manufacturing growth at and around Spokane International Airport will support manufacturing growth and, to a lesser extent, research and development. Successful economic development efforts may provide even more impetus to this industry. Also, while not necessarily market-driven, the continued growth of "public administration" jobs will continue to support both office and industrial development, particularly at Fairchild and the airport.

New estimated demand for office and industrial development over the next 21 years is as follows.

270,000 sq. ft. 6,340,000 million sq. ft.

Flex space, which can often bridge the gap between office and industrial, depending on total market demand, currently accounts for about 15 percent of office, industrial, and flex space in West Plains. At a similar rate, flex development would account for an additional 1.0 million square feet. However, flex is particularly challenging to forecast, so we would simply expect that any potential market gaps in the future would be plugged by new flex space.

Figure 11. Retail Demand, Primary Trade Area, 2019-2040



Residential Demand

The following chart shows total market area demand for multifamily and single-family housing units. In total, we project demand for 16,500 new residential units in the market area—an area containing Medical Lake, Cheney, and extending west about 7.5 miles from the 902/I-90 interchange.

As West Plains is unlikely to capture 100 percent of total market area demand, a capture rate needs to be established based on historical trends and anticipated future trends. Medical Lake, Cheney, and the surrounding unincorporated county land will continue to grow and capture a significant portion of demand. However, West Plains is well-poised to capture denser housing typologies, such as apartments and townhomes, as well as a smaller share of single-family homes. Indeed, a look at recent trends suggest that this is highly likely, particularly as subdivisions are completed and land becomes scarcer.

Between 2000 and 2019, West Plains was responsible for about 35 percent of new growth in the residential market area, up from 25 percent between 2000 and 2010, suggesting an increasing preference for residential development in West Plains.

As such, while we anticipate a similar rate of growth to continue in West Plains, we expect the area to be able to capture about 30 percent of total market area demand, equating to about 5,000 units. A conservative estimate of attainable capture, with 10 percent of single-family detached, 25 percent of single-family attached, and 40 percent of rental apartments would equate to 3,940 total units.

Office and Industrial Demand Forecast

The employment demand model provides the estimated amount of industrial and office development by new square feet in West Plains over over the next 20 years. Given the lack of competing employment lands elsewhere in the region (namely to the south and west of the West Plains study area) and the unique market characteristics of the West Plains, the West Plains boundary serves as the primary employment market area.

To calculate demand for employment uses, we apply annual growth rates to current employment data. Growth rates are triangulated for each industry based on published projected growth rates for the region, expected growth from new projects in the pipeline, and historical trends. Applying industry standards to these job totals, such as space needs and the percentage of workers in either office or industrial space, then provides total estimated building square footage.

Retail Demand

Total retail demand for the primary trade area over the next 21 years is shown in the following figure. This shows the total retail square footage expected to be supported by existing and future households and visitors.

The chart shows three sources of demand for the development of new retail space:

- Household growth, i.e., from new households moving into the market area;
- Leakage recapture, i.e., by "recapturing" some of the retail spending that households are making outside of the market area; and
- Replacement, reflecting the fact that existing space becomes obsolete over time. This is a small share of overall demand.

Retail demand for the entire primary trade area accounts for 2.3 million square feet over the next 21 years. With the model utilizing a 2.6 percent annual household growth rate, it is reasonable to think that additional demand may arise with other demand drivers, such as significant employment generation and tourism efforts.

Given the lack of other competing areas of retail throughout the primary trade area, West Plains can expect to capture the vast majority of total retail demand. Recent development trends show West Plains capturing upward of 75 percent of new retail demand in the trade area. Using this same metric, West Plains might capture 1.7 million square feet of retail within its boundaries, depending on available land, infrastructure capacity, and continued residential and employment growth.

Office Market Trends, Spokane Metro Region, 2019 Q2

Area	12 Month Deliveries	12 Month Absorption	Vacancy Rate (%)	Average Rent	12 Month Rent Growth
Metro	6.3k sf	493k sq. ft.	8.2%	$17.27 PSF	2.8%
Submarket	0k sf	74.7k sf	5.7%	$17.14 PSF	2.6%

Source: Costar

Demand Forecasts

Demand forecasts for retail, residential, office and industrial development over the next 20 years are shown in the following pages. Both the retail and residential forecasts utilize projected annual household growth rates. Given the lack of geographically specific projected growth rates for West Plains, LCG has triangulated multiple data sources—including existing county-wide projections and historical growth rates—to come up with a 2.6 percent annual growth rate in an attempt to minimize the potential margin of error.

Methodology

Retail Demand Forecast

The retail demand model provides estimated demand by square feet per retail category for the primary trade area, which extends west in a semi-circle 35-miles from near the US-2 and I-90 interchange, in an area encompassing Davenport, Harrington, Sprague, and Spangle. The primary trade area represents the area from which most retail spending will be derived.

LCG's demand model is built from consumer spending reports that show existing household demand and spending for every retail category. Projected annual growth rates are then applied to existing demand, leakage recapture potential is assessed, and an assumption is made about the level of redevelopment or replacement of standing inventory due to obsolescence.

The resulting demand model shows the total estimated square feet of *new* retail development that can be expected over the next 20 years in the primary trade area.

Residential Demand Forecast

The residential demand model provides the estimated number of single-family and multifamily housing units expected in the residential market area over the next 20 years. The residential market area is generally defined by the West Plains study area, Medical Lake, Cheney, Four Lakes, and Cheney Spokane Road—roughly a 7.5-mile radius around the 902/I-90 interchange. This subregion represents the residential market area, reflecting the area that shares similar characteristics with the West Plains study area and from which most competitive development will originate.

The residential model similarly utilizes triangulated growth rate projections to build off the existing housing inventory. The models apply these growth rates to the existing number of households by income to provide a breakdown of total demand by future income level. Assessing tenure trends (i.e. rent versus own) distinguishes the number of rental apartments to owned single-family homes and townhomes.

- Upcoming projects include the 2,560,000 square foot Amazon facility, Kenworth Trucking (80,000 sq. ft.), and a number of proposed projects in and around the Pacific Northwest Tech Park along US-2 that have not been finalized.
- Despite the lack of deliveries in in the last year, approximately 1.2 million square feet of new industrial space was built (not including flex) since 2010—accounting for more than one-quarter of existing inventory. The recent construction surge indicates an emerging industrial market in the West Plains that appears set to continue.

Area	12 Month Deliveries	12 Month Absorption	Vacancy Rate (%)	Average Rent	12 Month Rent Growth
Metro	266k sf	-81.3k sq. ft.	2.7%	$6.90	4.2%
Submarket	0k sf	-83.6k sq. ft.	6.1%	$6.78	4.5%

Source: Costar

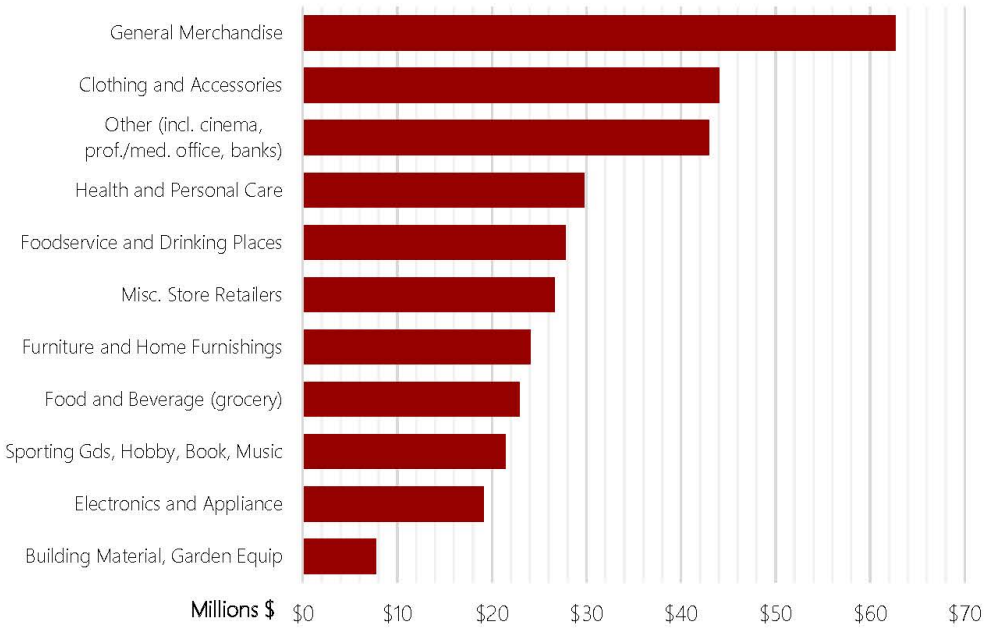
Office Market

The Spokane office market presents mixed indicators. Though pipeline activity remains limited, vacancy rates have fluctuated significantly. Deliveries during the current cycle have largely been build-to-suits, and more recent speculative projects are experiencing lease-up challenges. However, though rent growth remains fairly low, it remains stronger than both the historical average and the three preceding years. Additionally, investment in Spokane is increasing. Sales volume in 2018 was near the cycle peak, seeing the largest office trade of the post-recession era. That said, the office market appears limited to downtown, with even higher vacancies, lower rent growth, limited construction, and negative absorption in the north county submarket.

Market data pertaining to the West Spokane County Submarket is as follows.

- With only 536,000 square feet, West Plains' office sector is considered local. New construction has been very limited, although new medical-related offices have recently been in the pipeline.
- Vacancies have fluctuated significantly despite the lack of new construction, providing signs that the market would support new development.
- Rent growth among the existing inventory has been stagnant, with rents averaging around $17 per square foot (gross).
- With regard to absorption, the West Plains submarket has actually performed better than the wider region, helping to lower vacancies. A prolonged period of positive absorption may help attract office developers to the area.
- Despite weaker office market fundamentals (such as slower rent growth, relatively stagnant construction activity, and moderate average rents), office development is likely to ramp up, albeit as a secondary land use (to industrial, retail, and residential uses) and only in select locations. New development is likely to locate primarily around Flint Road near existing and planned office development. Continued infrastructure investment and successful economic development efforts are likely to support additional office growth. Further, residential growth will heighten the need for medical offices, such as clinics and dentists, and support specialized office developments, such as coworking spaces, business incubators, and small-scale speculative office space.

Figure 10. Spending Leakage by Retail Category



Industrial Market

The new Amazon distribution center aside, Spokane's industrial sector remains a local market despite exhibiting very strong fundamentals. Rent growth has posted substantial gains for years, and vacancies are well below the historical average. However, construction has been limited. Inventory has increased by only 3.7 percent since 2010, with absorption steadily outpacing new supply. The Spokane metro's moderate sales volume is in line with the historical average. Many properties trade hands each year, though at low prices, and typically both buyers and sellers are based within the region.

With this said, economic development and other marketing efforts have intensified in recent years to broaden the reach of Spokane's economy and attract and expand companies to the region. Indeed, the metro region currently boasts the fifth largest aerospace manufacturing cluster in the United States and the industrial market stands to gain a significant impetus if these economic development efforts are successful in attracting related industries.

Market data pertaining to the West Spokane County Submarket (West Plains) is as follows.

- Absorption has fallen in West Plains over the past 12 months, although the last 10 years has averaged around 110,000 square feet of positive net absorption. This is largely due to significant new vacancies in 2018, resulting in a vacancy rate spike. Vacancies have otherwise been very low over the past decade.
- Rent growth remains high—a positive sign for new development—although industrial development typically follows buy/sell trends than rental trends.

and convenience stores, Dutch Bros coffee, and continued development interest in the Cross Pointe commercial center. Further, not-yet-planned retail development is also likely in the near-term.

- Very low vacancies suggest a constrained market, but with zero to negative absorption and a volatile national market, there is reason to be guarded about the strength of Spokane's retail sector.
- Retail rents are consistent with averages for the metro, with marginally faster annual rent growth. New strip center retail is expected to rent for around $22 to $24 per square foot—significantly higher than current averages.
- The retail sector is struggling nationally, with retailers challenged to compete with the rapidly growing ecommerce sector. West Plains stands to benefit from high-traffic routes and good visibility along both the US-2 and I-90 corridors, potentially mitigating some of the negative impacts that ecommerce has had on traditional brick-and-mortar retail. The lack of existing retail development in these corridors means that new development is not constrained by the increasingly unpopular land use patterns that auto-oriented retailers and big box retail centers have created across the United States. Instead, West Plains has the opportunity to shape its commercial centers in a way that remains popular: as accessible, interesting, unique places that cater to a diverse array of needs.

Area	12 Month Deliveries	12 Month Absorption	Vacancy Rate (%)	Average Rent	12 Month Rent Growth
Metro	196k sf	-383k sf	5.1%	$13.35	0.5%
Submarket	0k sf	14.1k sf	3.0%	$13.34	0.9%

Source: Costar

National retail tenants are unlikely to have expressed significant interest in West Plains due to the lack of residential rooftops, lower household incomes, and stagnant growth. This has arguably resulted in an under-retailed environment with the majority of West Plains residents doing their shopping in the City of Spokane—the closest retail center.

This has perhaps contributed to significant spending leakage across *all* retail categories, as shown in the following chart. Leakage occur when household spending is not captured within the defined trade area. When local demand for a specific product is not being met within a trade area, consumers are going elsewhere to shop, creating retail leakage.

Opportunities appear to abound to recapture a substantial portion of existing leakage within West Plains in the form of new retail development. Recapturing all or even half of leakage is highly unlikely. Instead, community-serving retailers, such as restaurants, grocery stores, and health stores are likely to make significant inroads in recapturing existing leakage.

Additional information pertaining to the West Plains single-family housing market is as follows.

- Over the past five years, about 60 new homes have been built and purchased annually. A similar rate of construction and absorption over the next 21 years would see up to 1,300 new single-family homes built. However, the rate of construction has been increasing with each passing year, increasing to around 90 homes over the past year (an increase of 50 percent). While this trend is unlikely to see exponential increases through the study's horizon year of 2040, West Plains may see at least a tripling of this annual development rate (around 200 units per year). Indeed, with more than 3,000 known residential units (both single-family multifamily) in the pipeline, this is highly likely.
- With this said, land supply may soon be an issue. While there are several locations that could accommodate additional residential uses, particularly south of I-90 in unincorporated county land, much of this land is within the airfield overlay zone for Spokane International Airport and/or zoned for light industrial, limiting alternative land uses in these areas. Alleviating these regulatory barriers may be one strategy to accommodate additional residential growth. However, if not possible, residential growth immediate east of the West Plains study area boundary has seen moderate residential development activity. This could extend west into the West Plains area, but a lack of infrastructure and fragmented land ownership, among other reasons, is likely to cause this development to occur beyond the 2040 planning horizon for this study.

Home Price	Closed Sales	Percent of Total	Absorption (Units Sold per Month)	Active Listings	Months of Inventory
Under $200k	17	7%	1.4	1	0.7
$200k to $300k	197	81%	16.4	28	1.7
$300k to $400k	24	10%	2.0	22	11.0
$400k to $500k	4	2%	0.3	2	6.0
Total	242		20	53	2.6

Source: Redfin, Leland Consulting Group

Retail Market

Market indicators show mixed support for the Spokane retail sector. Low vacancies have tightened over the cycle, with absorption typically outpacing new deliveries. Spokane has also weathered a number of store closures, and all three of the metro's Shopko locations are set to close in the first half of 2019. However, rent growth is consistently low, and rental rates remain below the prerecession peak. Though 2018 saw the largest new retail delivery since the recession, a Costco build-to-suit, inventory has increased by only 1 percent this cycle.

Market data pertaining to the West Spokane County Submarket retail sector is as follows.

- With 1.1 million square feet of standing inventory in West Plains—equating to approximately 63 square foot per resident—the retail sector is currently only a local market (in other words, it fails to draw customers from outside its trade area).
- While only approximately 54,000 square foot of new retail development has been built since 2010, the next few years will see some significant deliveries, including the North 40 outfitters, a handful of new gas stations

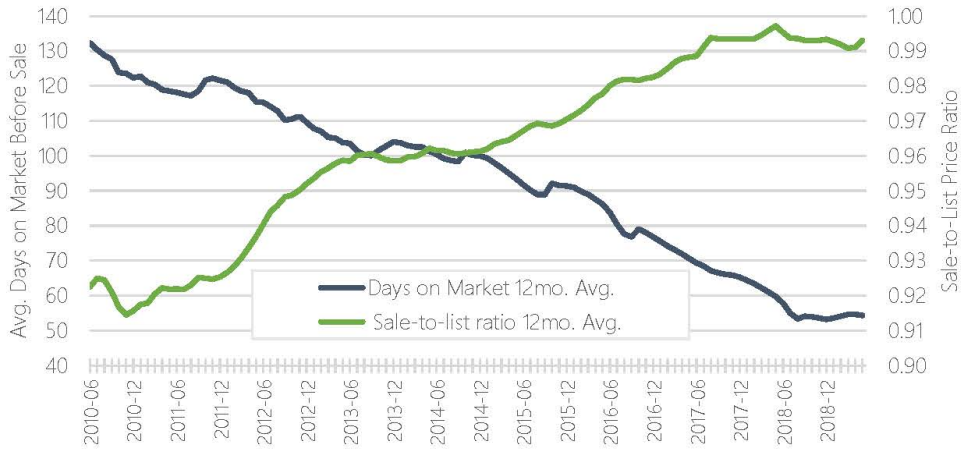
Single-family Residential. The West Plains residential market has been—at least historically—predominantly single-family oriented. Development activity has increased in Airway Heights and in Spokane County south of I-90, with many new single-family subdivisions coming online.

The Spokane housing market is viewed as affordable when compared to Seattle and Portland. It was also ranked fourth out of 300 cities in a national Realtor.com survey of the hottest markets, trailing Midland, Texas; Chico, California; and Colorado Springs, Colorado. The survey, released in March, measures listing views per property and the average amount of time a home is on the market. With such a hot market, it is not uncommon for sellers to receive multiple offers on homes, especially in the $300,000-or-less price range. However, high demand will usually drive up home prices. In the Spokane market, home prices rose more than 11 percent over the past year.

Two key indicators of market strength in the for-sale housing market are the average number of days on the market from list date to sale (closing) date, as well as the ratio of sale price to list price. These trends are presented below in Figure 9.

- For **days on market**, decreasing numbers indicate a strengthening market. Spokane County has continued to experience a decreasing average since the Great Recession.
- For **sale-to-list ratio**, a ratio of 1.0 indicates that homes are being sold for the original list price, on average. If this ratio is anywhere near or even above 1.0, the housing market is considered very tight and a seller's market. At 0.99, this rings true for Spokane County, and demand for new housing is strong.

Figure 9. Spokane County For-Sale Market Trends



Source: Zillow Market Research

The strength of the Spokane metro market has certainly spilled over into West Plains, with data indicating a very tight market. Indeed, current home listings account for less than three months of standing inventory, and new homes (built in the past five years) account for one-third of these sales. Strong demand exists for all housing types, but particularly for homes priced under $300,000, with only 1.7 months of standing inventory.

These trends go some way in underlining West Plains' industrial character. The lack of retail is a curious phenomenon: in contrasting form to much of the retail sector throughout the rest of the United States, it would appear that continued residential and employment growth in West Plains would only underpin the need and demand for significant retail construction going forward. As such, as we move into the demand forecast later in this report, land use projections indicate significantly higher rates of retail development over the next 20 year.

Market Sectors

This section includes a summary of current market trends at both the Spokane metro region (market) and West Plains (submarket) levels.

Residential Market

Multifamily Residential. Spokane's multifamily sector continues to benefit from strong fundamentals. Vacancy remained tight in 2018, even as over 900 new units came online. Though annual rent growth has moderated, rents are growing more quickly in Spokane than nationally. Buyers are taking increasing notice of the Spokane multifamily sector's strength: multifamily sales volume more than doubled in 2018, and investment benefits from numerous transactions.

Market data pertaining to the West Spokane County Submarket is as follows.

- The local multifamily market appears more constrained than the metro market, with very low vacancies (3.1 percent) and historically low deliveries (average of 45 units per year over the past 10 years).
- Average rents are relatively consistent with those throughout the Spokane metro region, with high rent growth likely reflecting the addition of several new projects.
- Th rate of multifamily construction has increased recently, with 232 units delivered over the past year—seven percent of the total inventory and the first deliveries since 2015. This growth is clearly in line with demand, with the market showing almost instant absorption.
- Average rents remain around $815 per unit, on average, but new construction been upwards of $900 to $1,000—in line with averages in the rest of the Spokane market. New multifamily construction on the Kalispel Tribal land, for example, is looking to rent for even more (between $1,000 and $1,500 for one-, two-, and three-bedroom units), which would easily be a historical high for the submarket. Generally, however, rent growth remains slower than the wider market, at 3.27 percent versus 5.21 percent for the submarket and market, respectively.
- Anecdotally, it is understood that significant demand exists for apartments, with several developers poised to develop if the opportunity arises. However, significant barriers exist, such as the airport overlay zone, the glut of light industrial zoning, and a lack of quality infrastructure in places.

Area	12 Month Deliveries	12 Month Absorption	Vacancy Rate (%)	Average Rent	12 Month Rent Growth
Metro	542 units	561 units	5.0%	$1.08 PSF	5.4%
Submarket	232 units	212 units	3.1%	$1.03 PSF	4.2%

Source: Costar

availability and capacity, the success of the PDA to attract a large aerospace-related user, and the lifting of regulatory barriers to development.

- **Multifamily Development.** Several large apartment projects have been recently constructed or are in the near-term pipeline. Historically challenging market conditions and long-lasting impacts from the recession potentially resulted in a highly constrained housing market with pent-up demand. As absorption slows and the market right-sizes, there may be a glut of multifamily units in the next five years, but the housing market is likely to remain strong.

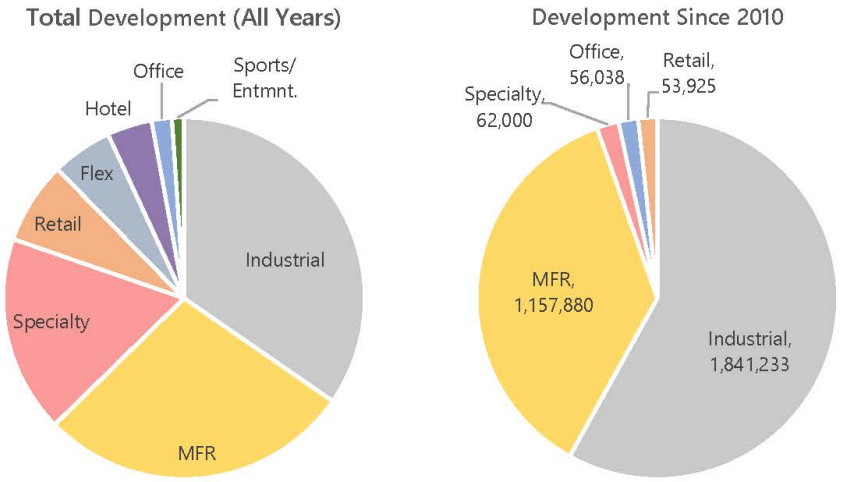
MARKET ANALYSIS

Real Estate Market Summary

With regard to non-institutional or non-single-family residential land uses, the West Plains study area is primarily made up of industrial and multifamily land uses, with a relatively small amount of retail, flex, office, and other developments, as shown in Figure 8, below. These are usually more equally proportioned, and the retail sector is typically one of the largest in terms of square footage. For West Plains, it would appear that these other real estate sectors are lagging behind industrial and residential development.

Since 2010, this trend has only intensified, with multifamily development increasing the pre-2010 inventory by about 50 percent and the industrial market also showing significant growth (not including under construction or planned developments, such as Amazon and Kenworth Trucking). As an earlier section highlight national development and investment prospects, this closely follows national trends that suggest strong support for industrial and residential development.

Figure 8. West Plains Development by Total Square Feet and Year Built



Source: Costar

- **Strong Transit System.** STA is adding new routes to accommodate residential and employment growth in the area. New transit routes help connect the area, especially people living in Cheney and Medical Lake to jobs in and around Airway Heights. STA anticipates these new routes, as well as a planned BRT route in 2040 along US-2, to induce growth.
- **New Infrastructure Investment.** The PDA is undertaking a regional stormwater study and aim to invest in critical stormwater infrastructure to support new investment in the next two to three years. This will be a coordinated effort focused on implementing other infrastructure elements, largely made possible by a recent grant.

Development Trends

- **Tribal Land.** There is significant development interest in both Tribe areas, with both Tribes expressing a desire for development. Immediate plans include casino/event space expansions. Additional development is expected to be market-driven, with a range of land uses on the table, including housing, retail, entertainment, and hotel.
- **Amazon.** The new Amazon facility is expected to drive significant interest for associated distribution, logistics, and other industrial uses in the near-term.
- **Phasing.** Highway 2 and I-90 corridors are likely to approach build-out in the next 20 to 30 years, particularly with regard to residential land. The area east of Airway Heights along US-2 may see build out achieved even sooner. Industrial development surrounding Macfarlane Road and the new transload facility is anticipated in the near-term, but only with new investments in infrastructure.
- **Airport Development.** Spokane International Airport and the PDA are targeting large aerospace manufacturing companies for its land to the west of the airport. A third runway is planned in this area which will absorb a significant chunk of the land, particularly once the land at either end is subsequently classified non-developable due to aircraft takeoff/landing zones. The additional runway is still considered a long-term project and construction may occur beyond the 2040 planning horizon of this project.

  This land is a key component in the airport's efforts to attract Boeing or other relating suppliers as Boeing targets 2025 for its new midsize aircraft (NMA). Spokane is thought to be competing with North Carolina for the opportunity to home Boeing. If successful, around 300 acres of aeronautical land will be developed, potentially generating around 5,000 new jobs.

- Spokane International Airport also owns the land east of Spotted Road (roughly bounded by the US-2 and Geiger Blvd.)—about 590 acres of vacant space that has had some infrastructure investment. However, despite investments in roads more than 15 years ago the area has remained vacant with little development interest. This is unlikely to change, although there is a planned interchange and new road that may improve access and, subsequently, prospects.
- **Hotel Growth.** Additional hotel development is expected in the I-90 corridor and near the airport.
- **Limited Office Market.** While the office market is considered limited, new development is likely to occur north of the airport. The PDA is looking into an innovation park, which will include research and development (R&D) to partner with the extensive number of local educational institutions in the area.
- **Increasing Rate of Development.** Development over the past few decades has been highly constrained. However, the rate of development over the past two to three years has been unprecedented and is likely to continue as long as the economy remains strong. Continuing growth largely depends on infrastructure

- **Image Issue.** West Plains and the greater Spokane region does not typically attract significant national interest, but the area is beginning to "get on the map" due to a number of new large businesses and an extensive marketing effort. This also extends to substandard perceptions about the school district and quality of life, irrespective of actualities.
- **Regional Competition.** Post Falls and Spokane Valley may also prove difficult to compete against for industrial development. However, West Plains possesses unique competitive advantages with the airport, tribal land development plans, Fairchild AFB, and the new Amazon facility.
- **Lack of Households for Retail.** West Plains has about 35 square feet of retail space per capita, significantly higher than the 15 to 20 square feet that is typically considered "equilibrium." While the West Plains trade area extends significantly beyond its boundaries to the southwest (i.e. the area containing the consumer base that existing retail serves), retailers are today placing increasingly more importance on activity densities and income levels. While prospective retail tenants in the past have struggled to see a significant market in West Plains for new development—citing feasibility concerns in addition to a saturated market—significant household growth and mid-wage job growth is expected to improve retail prospects.

Opportunities

- **Residential Demand.** Demand for residential uses typically follow large job generators, such as Amazon, Kenworth Trucking, Caterpillar, casino growth, etc. These types of uses are especially driving demand for workforce housing. Residential development is allowed in the County area south of I-90 despite a designation as light industrial in the Spokane comprehensive plan, resulting in several new subdivisions and other residential projects. This is likely to continue until the existing developable residential land has built out. Rezoning certain areas or removing regulatory and physical barriers to development would likely result in further residential development within the next few decades.
- **Fairchild Air Force Base Growth.** Fairchild has been selected to receive 12 additional KC-135 refueling aircraft, which will begin arriving in 2020. Fairchild is said to be planning to reactivate its 97th Air Refueling Squadron, as well as an unnamed maintenance unit, to handle the Stratotankers. About 1,000 additional airmen and family members combined are expected to move to the Spokane region, potentially having a profound positive impact on demand for housing and commercial amenities in West Plains. Beyond this known near-term growth, there is the potential for further employment growth.
- **Industrial Growth.** Manufacturing, transportation, and distribution are likely to drive industrial development, but these users are not necessarily expected to require access to the airport. Instead, transportation infrastructure and clustering nearby mutualistically beneficial users is of greater importance.
- **New Transload Facility.** The new transload facility and rail spur presents a tremendous opportunity for major industrial development and employment generation. The facility is expected to support the expansion of existing industries and improve the prospects of attracting major companies to the area.
- **Opportunity Zone.** Much of West Plains is considered an Opportunity Zone—a tax incentive program that is likely to increase development in the area. However, Spokane also has several Opportunity Zones in prime development locations, so this may prove less significant.
- **Plentiful Land Supply.** There is plentiful vacant land that is ripe for new development—depending on the provision of adequate infrastructure and the successful navigation of the regulatory restrictions that apply to some of the land (e.g. FAA regulations, flight overlay zones, etc.).
- **The I-90 corridor** is a desirable place to develop for industrial and commercial users, and benefits from City of Spokane infrastructure (versus Airway Heights, where there is less infrastructure capacity for these users).

West Plains Survey Results Analysis

West Plains Subarea Transportation Management Plan

Washington State Department of Transportation

WSDOT Eastern Region Planning

December 2019

The West Plains is comprised of several zip codes: 99011, 99001, 99022, 99004, and 99224. 355 people responded that they lived in one of the five zip codes that make up the West Plains. 278 people live in zip codes located outside of the West Plains, and 1 person did not respond for a total of 634 responses (Table 1.1).

The discrepancy between the first two questions about where participants live, is 44 responses. In the first question, 311 people said that they live inside the West Plains as compared to second question, where 355 people live in zip codes located in the West Plains; this may be attributed to the West Plains' lack of distinct boundaries. Additionally, zip codes boundaries may not help define the West Plains boundaries, and may cross jurisdictional lines. However, the data shows that about half of the total survey participants live inside the West Plains or perceive themselves as living in the West Plains.

Table 1.1

In what zip code is your home located?		
Answer	Number	Percent
Skipped	1	0%
Outside the West Plains	278	44%
99011	7	1%
99001	95	15%
99022	112	18%
99004	46	7%
99224	95	15%
Total	634	100%

3. *Do you work inside or outside of the West Plains?*

A total of 328 people responded that they work inside the West Plains and 283 said they work outside the West Plains. 23 people did not respond to the question. People who "work"

III. Detailed Findings

The purposes of this section is to analyze individual questions and responses for each of the surveys.

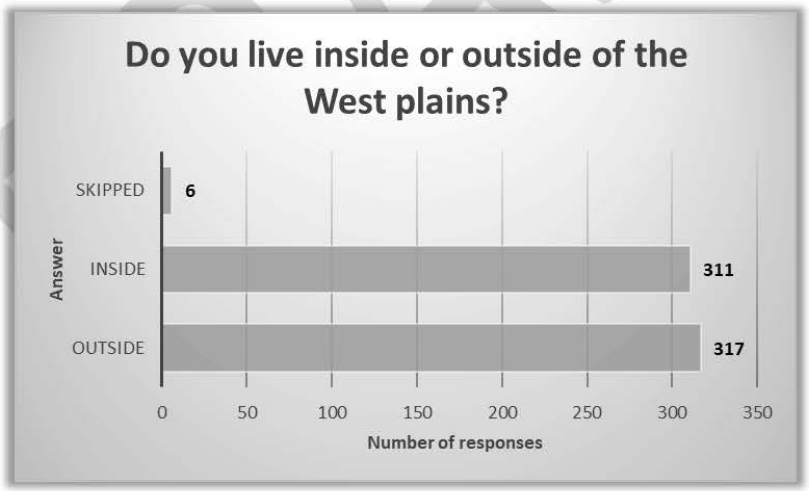
A. West Plains Subarea Transportation Management Plan Survey Questions (June 2019) - Main Survey

This survey intended to gauge the community's thoughts and concerns about improving mobility around the US 2 corridor

1. Do you live inside or outside of the West Plains?

Of the responders, 311 people live inside the West Plains and 317 live outside. 6 people did not respond to the question (Figure 1.1).

Figure 1.1



2. In what zip code is your home located (Enter 5-digit Zip code; for example, 00544 or 94305)

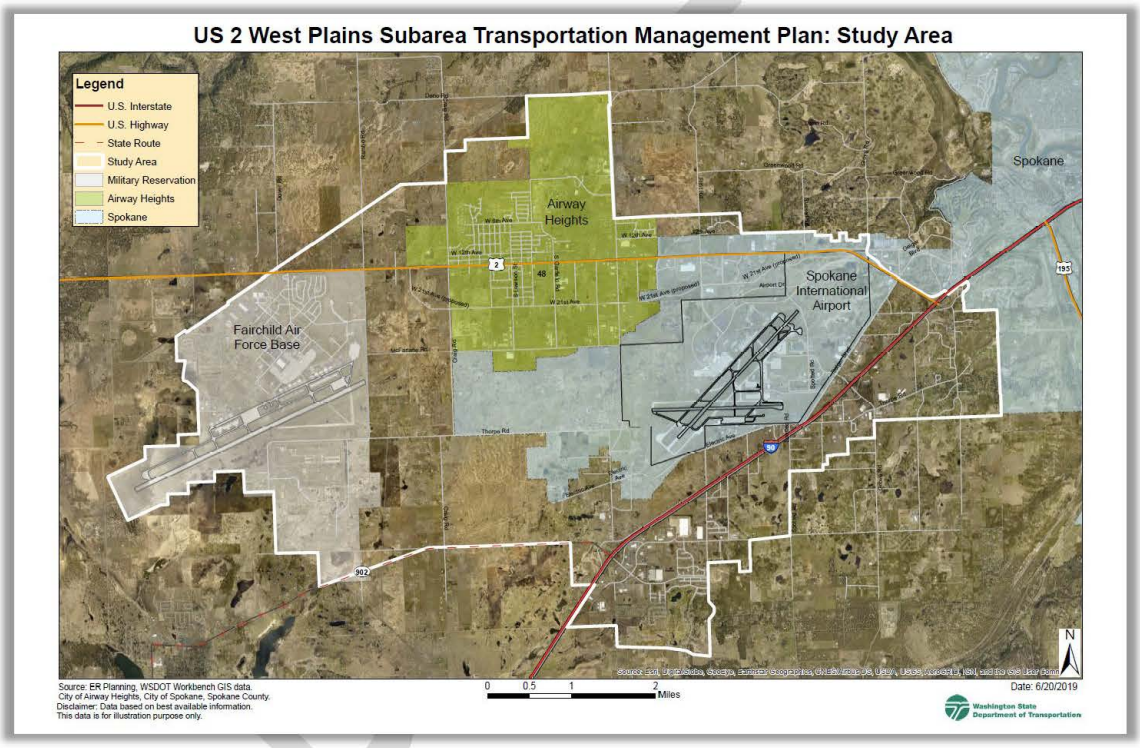
II. Summary of Key Finding

Nearly 1,500 surveys were received from adults that live and work both inside and outside of the West Plains. The surveys were open for the same 90 day duration and were available to take online or at community engagement booths set up by WSDOT in conjunction with local West Plains events. The main survey titled, "West Plains Subarea Transportation Management Plan Survey Questions (June 2019)," received 634 responses, and was intended to gauge the communities thoughts and concerns about improving mobility around the US 2 corridor by responding to mostly open-ended questions. The second survey titled, "West Plains Subarea Transportation Management Plan - Typical Daily Travel Survey (June 2019)," received 447 responses, and asked participants to describe when and why they use the US 2 corridor. The third survey, "West Plains Subarea Transportation Management Plan – A Supplemental survey for those that 'live or work' in Airway Heights (June 2019)," received 408 responses and asked participants to rate how Airway Heights is as place to visit, work, and live etc. and asked people to rate what Airway Heights should focus on in the next two years.

Several themes have emerged from each of the survey questions, but have significant overlap across the three surveys. Our analysis of the survey data identifies major themes about the community's perception of the West Plains and US 2 corridor: While traffic congestion is of concern to the commuters in and around the West Plains, there is opportunity to improve the safety for all users by enhancing the connection of bicycle and pedestrian facilities and improving the local network,

project at the right time. The *West Plains Subarea Transportation Management Plan* study area includes an 8 mile segment of the US 2 corridor, from the 1-90 interchange west to the entrance of Fairchild Air Force Base. The land use travel-shed study boundary is shown in white on the map below (Figure 1.0).

Figure 1.0



In addition to the quantitative analysis, an integral part of the *West Plains Subarea Transportation Management Plan* data collection is the qualitative feedback received through the deployment of three surveys. Each survey received between 400 and 600+ responses. The surveys were designed to help WSDOT and partners understand the issues and opportunities identified by the community members living and working in and around the West Plains.

West Plains Survey Results Analysis

I. Introduction

The West Plains of area Washington State is located west of the City of Spokane and spans multiple jurisdictional lines. The West Plains is comprised of the City of Airway Heights, the City of Four Lakes, the City of Medical Lake, Spokane County, City of Spokane, Fairchild Air Force Base, Spokane International Airport, Spokane Tribe and Kalispell Tribal lands. Due to the geographic location, cities of the West Plains can be defined as rural and is characterized as flat prairie land with low lying hills and buttes.

The US 2 corridor runs east and west through the West Plains. Interstate 90 and State Route 902 play important roles in in connecting areas of the West Plains. Recently, the area along the US 2 corridor and 1-90 has seen an increase in the number of developments, recently naming it the fastest growing area in the state of Washington. This growth includes commercial businesses, industrial and residential development. The new and existing developments traffic feed US 2 and 1-90, however the I-90 interchange in the West Plains is being improved to handle new growth adjacent to it. The US 2 corridor, is often congested with high traffic volumes during peak hours due the large employment centers, causing safety issues for travelling pedestrians and automobiles.

Local municipalities and agencies have conducted more than nineteen plans and studies since 2006, that have examined the needs of the US 2 corridor, local network and communities of the West Plains. The *West Plains Subarea Transportation Management Plan*, led by the Washington State Department of Transportation and partner agencies, refines previous studies and aligns transportation recommendations in to one comprehensive subarea plan. By collaborating with partners early on, this subarea plan will help to develop practical solutions or the right sized

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Additionally, WSDOT's Eastern Region Planning team engaged with members of the West Plains community through "listening posts" and events. The surveys were promoted at the Medical Lake Founders Day, Sunday Fest at Northern Quest & Casino, Airway Heights Festival, Fairchild Air Force base, Yokes grocery store. The survey feedback will help decision makers address the issues and opportunities regarding the multimodal transportation system in and around the West Plains.

Appendix A: Main Survey

Appendix B: Typical Daily Travel Survey

Appendix C: Supplemental Survey for those who "live and work" in Airway Heights

important. According to the responses, people would like to see Airway Heights focus on improving safety, improving the ease of getting to places in and around Airway Heights, and improving the economic conditions (Figure 3.2).

IV. Recommendations

In an effort to respond to the community's preferences identified in this report, please consider the following recommendations.

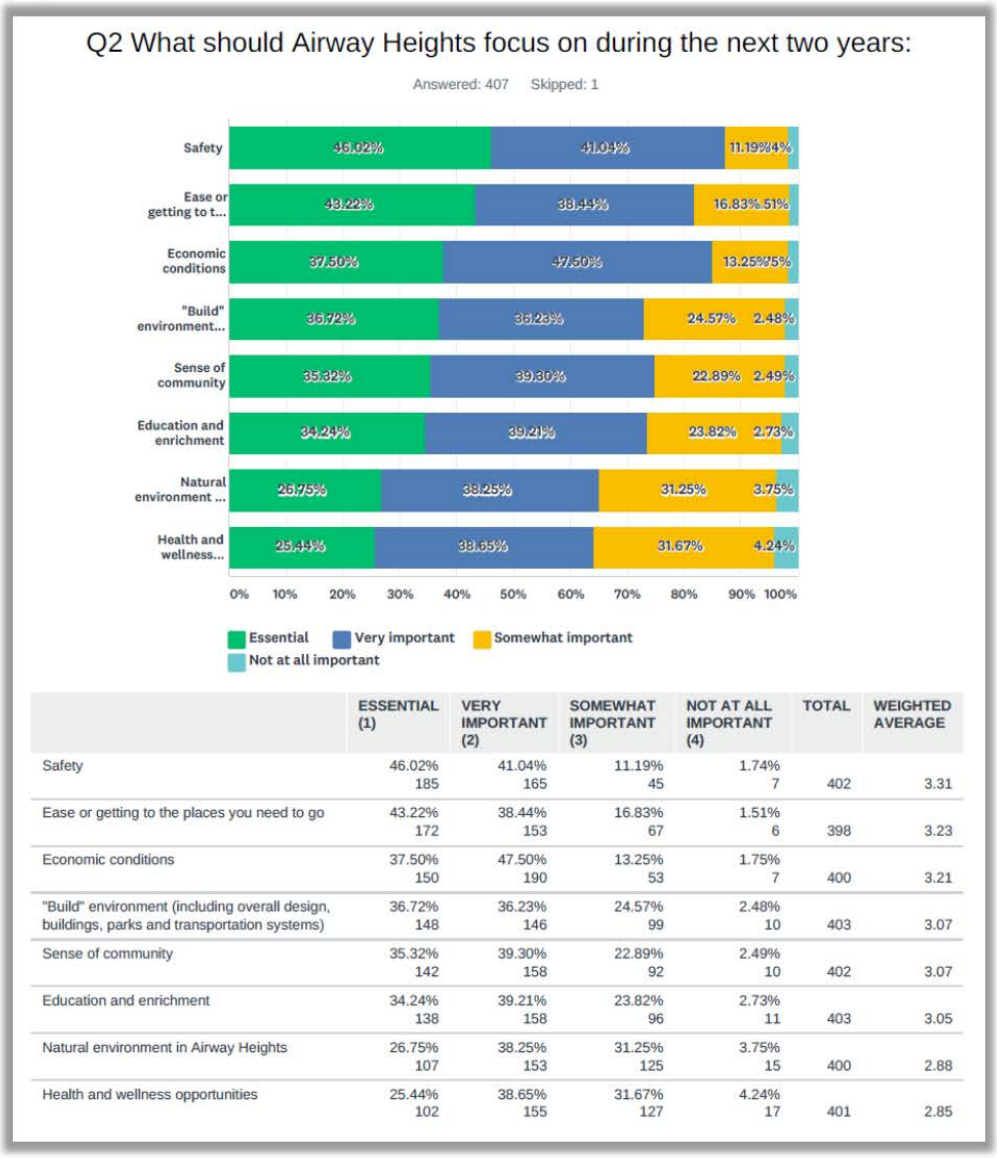
- Enhance the local roadway network connections and traffic control
- Enhance the bicycle and pedestrian mobility with sidewalks, trails, and bike lanes
- Encourage housing developments to integrate green space for children and families that are well connected to existing and future trails and other desired destinations
- Enhance the capacity of Fairchild Air Force Base main gate to relieve congestion on US 2 or improve connection from 1-90 to the main gate.
- Support projects that enhance public transportation

V. Methodology

The three surveys and questions were drafted in collaboration with partner agencies. The surveys were available online and paper format for approximately 90 days during April, May and June. Partner agencies such as the City of Spokane helped advertise the West Plains Surveys on their website, blog and social media accounts. The Washington State Department of Transportation (WSDOT) posted the Survey Monkey links on the project website ConnectWestPlains.com. The survey links were promoted through the Airway Heights Next Door App.

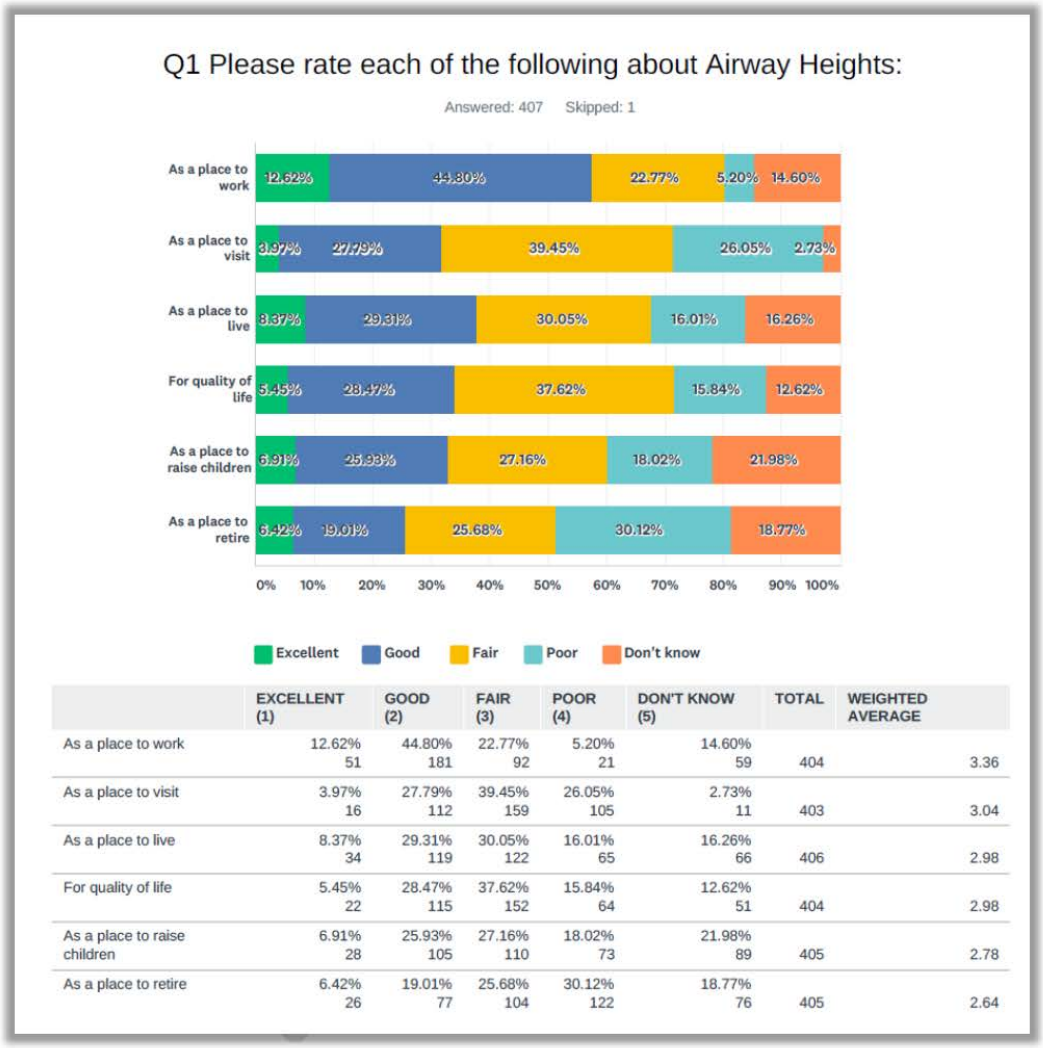
Similarly, participants were asked what Airway Heights should focus on during the next two years, by rating categories as essential, very important, somewhat important, or not at all

Figure 3.2



	ESSENTIAL (1)	VERY IMPORTANT (2)	SOMEWHAT IMPORTANT (3)	NOT AT ALL IMPORTANT (4)	TOTAL	WEIGHTED AVERAGE
Safety	46.02% 185	41.04% 165	11.19% 45	1.74% 7	402	3.31
Ease or getting to the places you need to go	43.22% 172	38.44% 153	16.83% 67	1.51% 6	398	3.23
Economic conditions	37.50% 150	47.50% 190	13.25% 53	1.75% 7	400	3.21
"Build" environment (including overall design, buildings, parks and transportation systems)	36.72% 148	36.23% 146	24.57% 99	2.48% 10	403	3.07
Sense of community	35.32% 142	39.30% 158	22.89% 92	2.49% 10	402	3.07
Education and enrichment	34.24% 138	39.21% 158	23.82% 96	2.73% 11	403	3.05
Natural environment in Airway Heights	26.75% 107	38.25% 153	31.25% 125	3.75% 15	400	2.88
Health and wellness opportunities	25.44% 102	38.65% 155	31.67% 127	4.24% 17	401	2.85

Figure 3.1



	EXCELLENT (1)	GOOD (2)	FAIR (3)	POOR (4)	DON'T KNOW (5)	TOTAL	WEIGHTED AVERAGE
As a place to work	12.62% 51	44.80% 181	22.77% 92	5.20% 21	14.60% 59	404	3.36
As a place to visit	3.97% 16	27.79% 112	39.45% 159	26.05% 105	2.73% 11	403	3.04
As a place to live	8.37% 34	29.31% 119	30.05% 122	16.01% 65	16.26% 66	406	2.98
For quality of life	5.45% 22	28.47% 115	37.62% 152	15.84% 64	12.62% 51	404	2.98
As a place to raise children	6.91% 28	25.93% 105	27.16% 110	18.02% 73	21.98% 89	405	2.78
As a place to retire	6.42% 26	19.01% 77	25.68% 104	30.12% 122	18.77% 76	405	2.64

2. *What should Airway Heights focus on during the next two years?*

C. West Plains Subarea Transportation Management Plan Survey: A Supplemental survey for those that "live or work" in Airway Heights (June 2019)

The purposed of this survey was to understand issues and opportunities specific to Airway Heights.

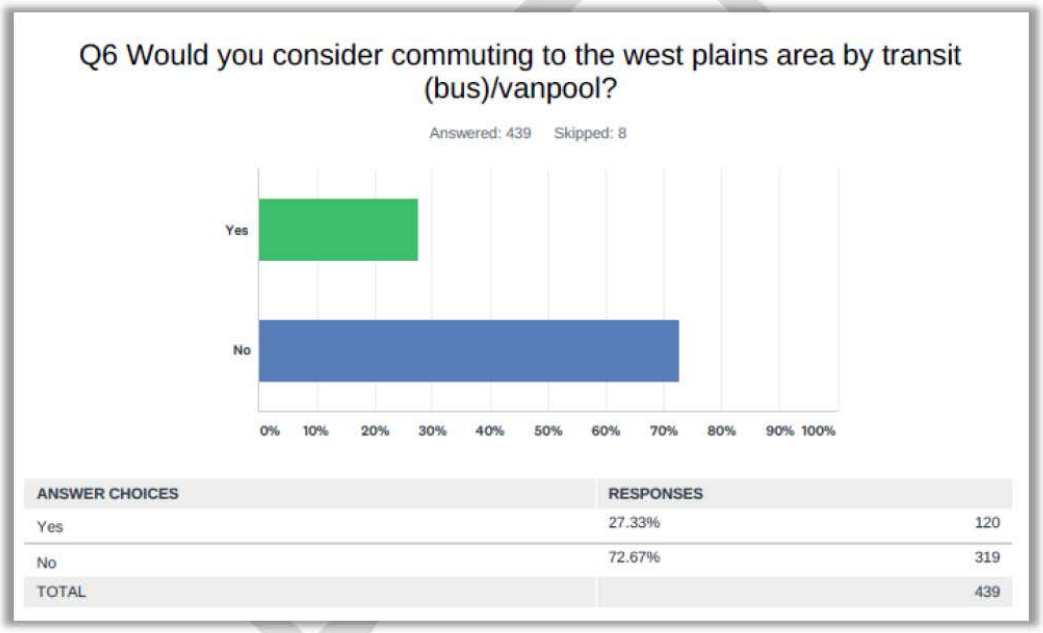
1. Please rate each of the following about Airway Heights.

According Survey Monkey's calculated weighted average, the higher the number the higher the importance, people rated aspects of Airway Heights by responding to excellent, good, fair, poor, or don't know. Airway heights scored the highest, 3.36, "as a place to work" followed by, 3.04 "as a places to visit." The two categories with the lowest scores are 2.78, "as a place to raise children" and 2.64 "as a place to retire" (Figure 3.1). There is opportunity to enhance family friendly amenities and activities, while supporting the aging population.

6. Would you consider commuting to the West Plains area by transit (bus)/vanpool?

In the first survey, many people had suggestions about how to improve public transportation in the West Plains, so there is little surprise when 73% of people responded "no" when asked if they would consider using public transportation (Figure 2.6). The other 27% would consider public transportation or already do.

Figure 2.6



ANSWER CHOICES	RESPONSES	
Yes	27.33%	120
No	72.67%	319
TOTAL		439

5. What changes would you like to see happen on this segment on the US 2 within the next two years?

According to the open-ended comments, people would like to see the traffic flow and safety improve around intersections, some people suggested adding additional traffic signals near the Movie Theater and increasing the size of the roundabout in front of the Spokane Tribe Casino. Much emphasis was placed on increasing safe turn lanes and channelization for people entering and exiting the US 2 corridor. Community members suggested improving the local network and enhancing the connection from 1-90 to the Fairchild Air Force Base entrance for those commuters travelling to and from the base. Participants also identified a need to improve pedestrian and bicyclist facilities, such as sidewalks, buffered bike lanes, and improved lighting, thus improving the safety for all users (.

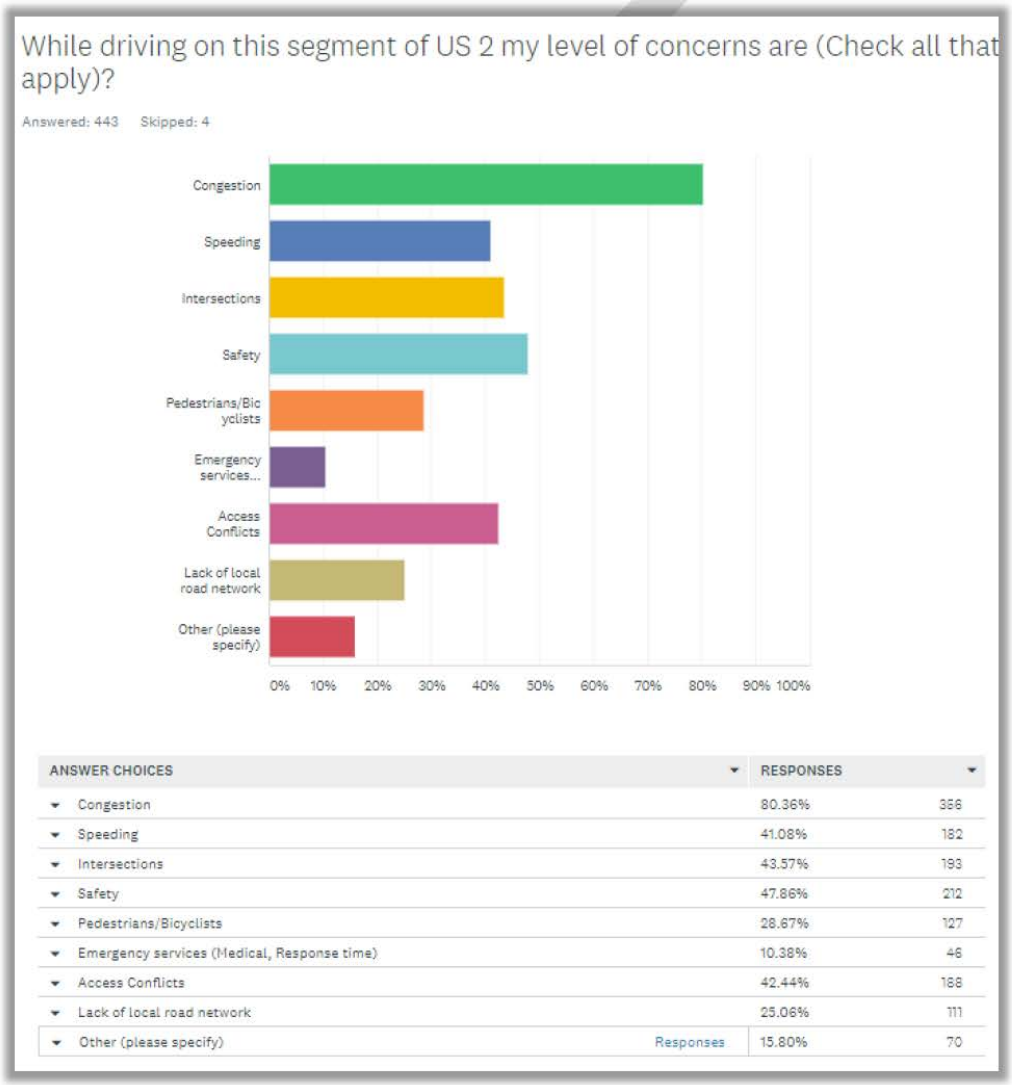
Table 2.1

Q.5 What changes would you like to see happen on this segment on the US 2 within the next two years?			
Theme Rank	Theme	# of Responses	Percent
1	Traffic Control (roundabouts, traffic lights, intersections)	71	16%
2	Increase Sidewalks & Other Pedestrian Facilities	59	13%
3	Channelization & Improve Turn Lanes	59	13%
4	Improve Local Network	55	12%
5	Other	51	11%
6	Widen Lanes & Divide Directions	44	10%
7	Improve Safety for All Users	35	8%
8	Enhance Enforcement& Reduce Speed	27	6%
9	Improve Access/Exit Fairchild AFB	20	4%
10	Improve Public Transpiration	15	3%
11	Not Sure	9	2%
	Total	445	100%

4. While driving on this segment of US 2 my level of concerns are (Check all that apply)

The leading concerns for community members driving the US 2 corridor is the traffic congestion, intersection control, the safety for all users and speeding (Figure 2.4).

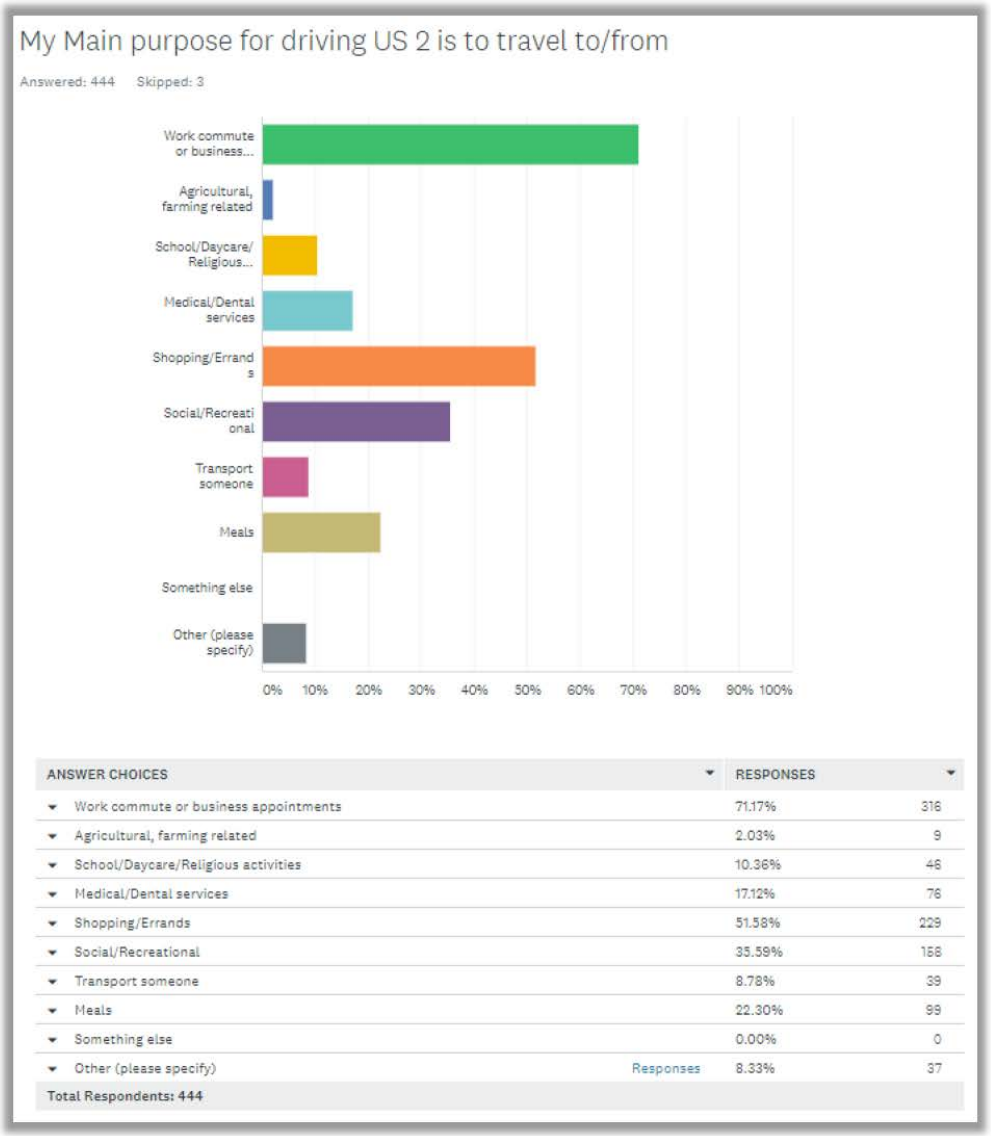
Figure 2.4



ANSWER CHOICES		RESPONSES	
Congestion		80.36%	356
Speeding		41.08%	182
Intersections		43.57%	193
Safety		47.86%	212
Pedestrians/Bicyclists		28.67%	127
Emergency services (Medical, Response time)		10.38%	46
Access Conflicts		42.44%	188
Lack of local road network		25.06%	111
Other (please specify)	Responses	15.80%	70

Survey participants were asked to "check all that apply" in regards to their main purpose for driving the US 2 corridor. The top three themes, that again confirm earlier responses, are work commute or business related trips, errands, and recreational activities (Figure 2.3).

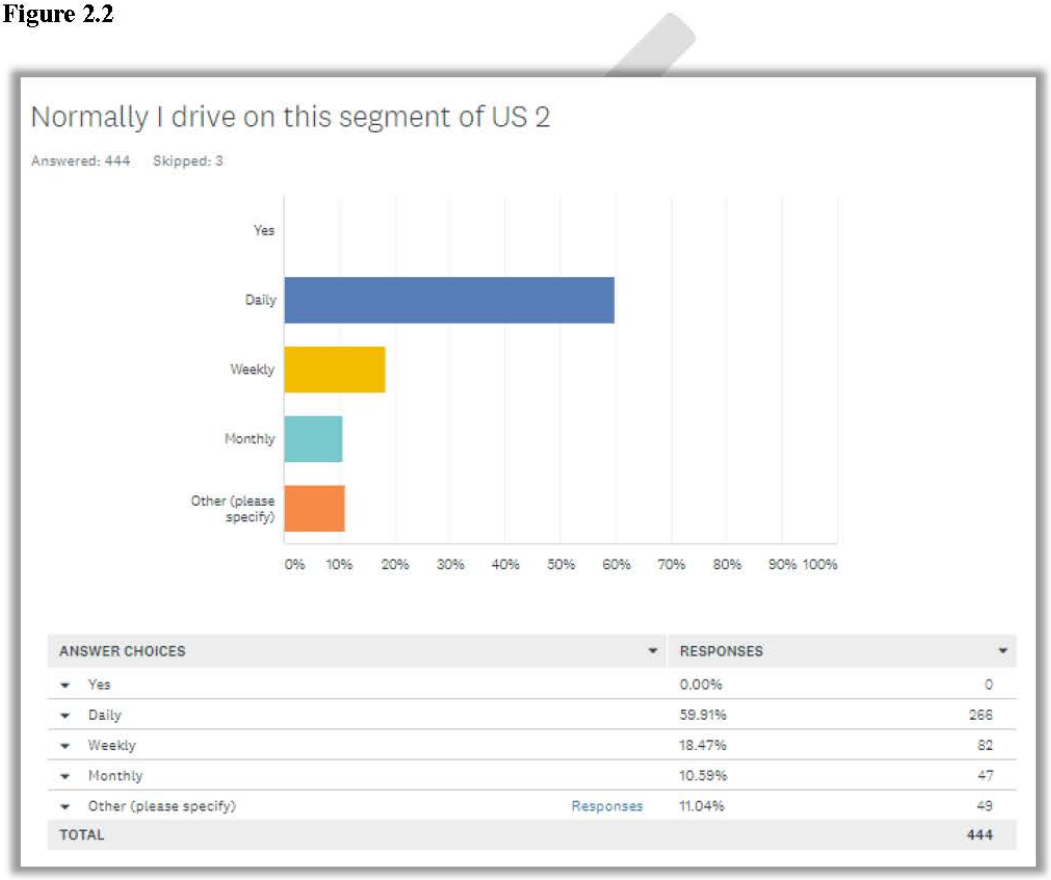
Figure 2.3



ANSWER CHOICES		RESPONSES	
Work commute or business appointments		71.17%	316
Agricultural, farming related		2.03%	9
School/Daycare/Religious activities		10.36%	46
Medical/Dental services		17.12%	76
Shopping/Errands		51.58%	229
Social/Recreational		35.59%	158
Transport someone		8.78%	39
Meals		22.30%	99
Something else		0.00%	0
Other (please specify)	Responses	8.33%	37
Total Respondents: 444			

People were asked when they "normally" drive the US 2 corridor. This refers to the segment of the US 2 corridor within the West Plains Subarea Transportation Management Plan (Figure 1.0) from I-90 to the entrance of Fairchild Air Force Base. About 60% of people drive the US 2 corridor daily, 18% drive it weekly and 11% drive it monthly.

Figure 2.2



ANSWER CHOICES		RESPONSES	
Yes		0.00%	0
Daily		59.91%	266
Weekly		18.47%	82
Monthly		10.59%	47
Other (please specify)	Responses	11.04%	49
TOTAL			444

3. My main purpose for driving US 2 is to travel to/from.(Check all that apply)

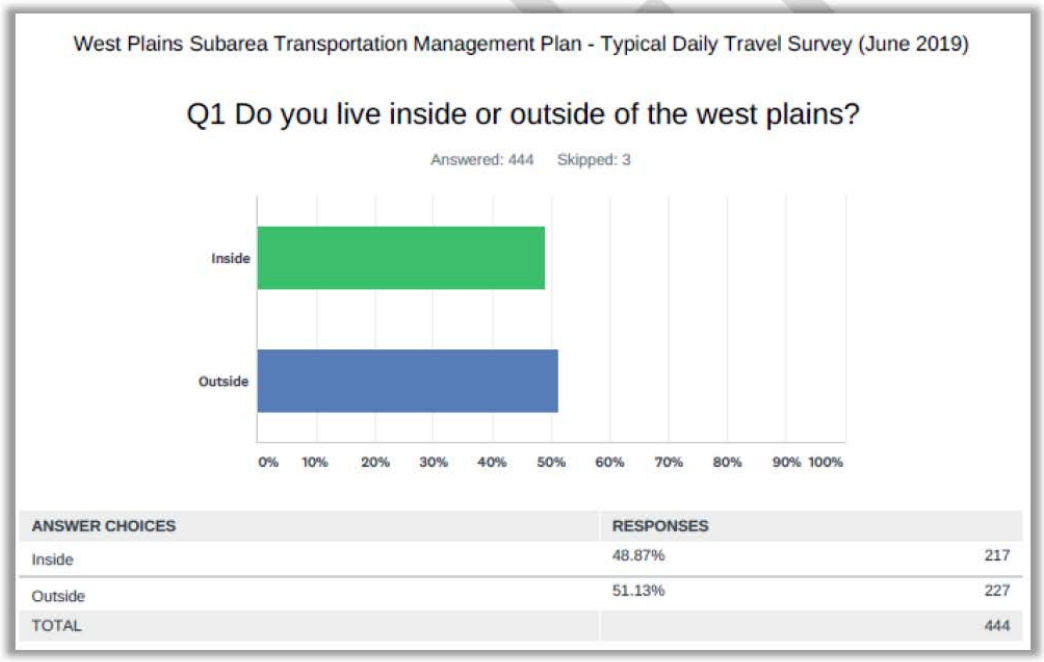
B. West Plains Subarea Transportation Management Plan: Typical Daily Travel Survey (June 2019)

The purpose of the "Typical Daily Travel Survey" is to understand travel patterns of people who use the US 2 corridor.

1. *Do you live inside or outside of the West Plains?*

Of the community members who participated in this survey, about 51% live outside of the West Plains, while about 49% live inside the West Plains.

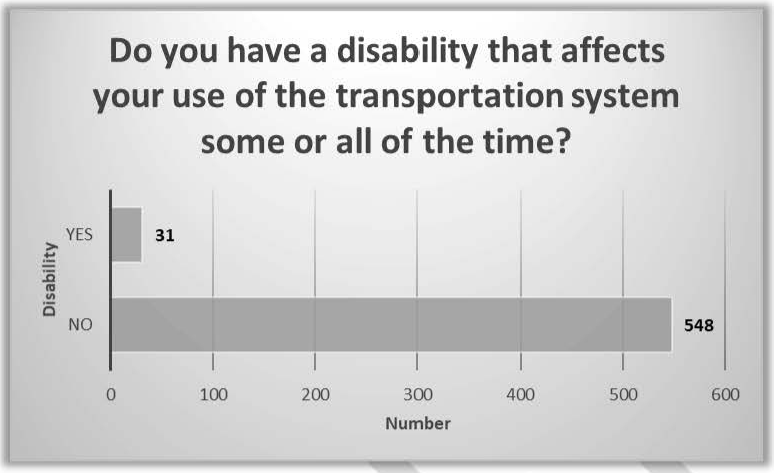
Figure 2.1



ANSWER CHOICES	RESPONSES	
Inside	48.87%	217
Outside	51.13%	227
TOTAL		444

2. *Normally I drive the on this segment of the US.*

Figure 1.5



13. What is you gender identity?

Of the 634 responses, 575 people responded to the question about gender identity. About 50% of women took the survey, while 44% were men. The remaining responses answered "Prefer Not to Say" (Figure 1.6).

Figure 1.6

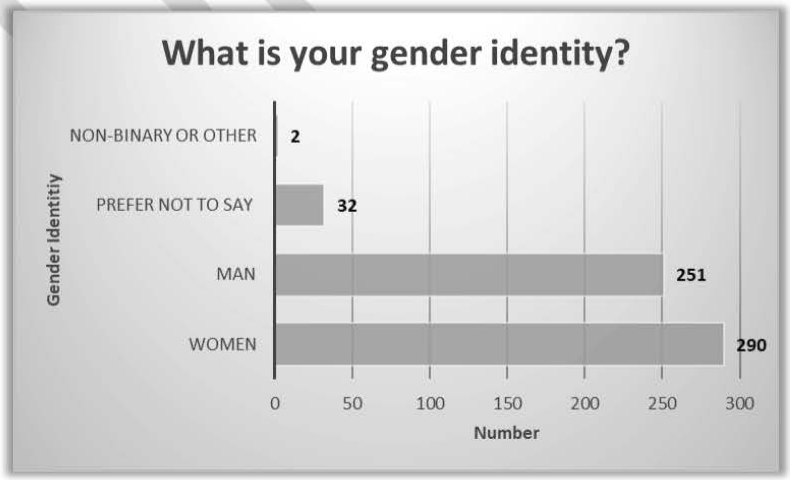
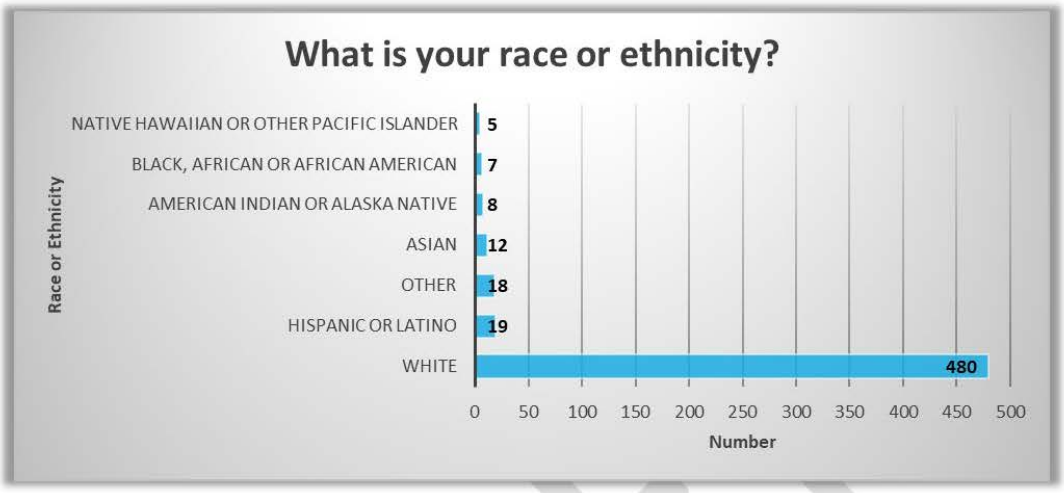


Figure 1.4



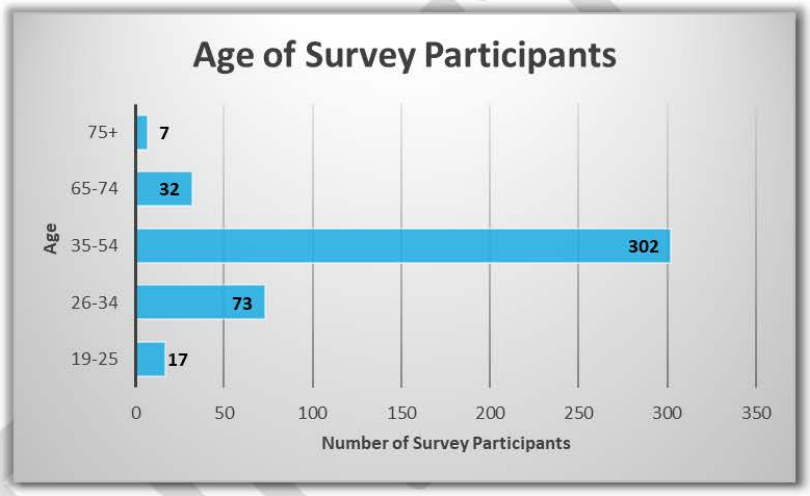
12. Do you have a disability that affects your use of the transportation system some or all of the time?

Of the 634 survey responses, 579 people responded and about 95% said "No" they do not have a disability that affects their use of the transportation system some or all of the time. The remaining 5% of people responded "Yes," they do have a disability that affects their use of the transportation system some or all of the time (Figure 1.5).

10. What is your age?

Of the 634 survey responders 431 people shared their age. About 70% are between the ages of 35 and 54 years. About 17% of survey responders are between the ages of 26 and 34 years. 7% of people who participated, are between the ages of 65 and 74 years old (Figure 1.3).

Figure 1.3



11. What is your race or ethnicity?

Of the 634 survey, 549 people share their race or ethnicity. Of the 549 participants, 480 people or 87% identify with being "White." About 3% said "Hispanic or Latino" and another 3% said "Other." About 2% selected "Asian" and the remaining 5% split between "American Indian or Alaska Native," "Black, African or African American," and "Native Hawaiian or Other Pacific Islander." (Figure 1.4).

9. Do you feel the US 2 corridor is similar on weekdays and weekends, or are there noticeable differences? Please describe.

The survey comments overwhelmingly show that people perceive the US 2 corridor as having noticeable difference between weekdays and weekends. 50% of the responses described the weekdays as having significantly higher traffic congestion. Some commented that there is a noticeable difference along the US 2 corridor during events at the Fairchild Air Force Base and the Casinos. Seasons and weather can affect the travel patterns along the US 2 corridor; people commented that during the summer months, there is an increased amount of RV and recreational travel on the weekends, in addition to the weekday congestion (Table 1.7). 8% said that the US 2 corridor is always busy, and 12% perceive the corridor as more or less the same on weekdays versus weekends.

Table 1.7

Q9. Do you feel the US 2 corridor is similar on weekdays and weekends, or are there noticeable differences? Please describe.			
Theme Rank	Theme	# of Responses	Percent
1	The weekdays are busier (Rush hour)	211	36%
2	Weekends are not as busy (Slower on non-work days)	79	14%
3	I don't Know	73	13%
4	More or less the same	72	12%
5	It's always busy	47	8%
6	Other	35	6%
7	Special events cause noticeable difference	28	5%
8	The weekends are busier	24	4%
9	Types of communters change on weekend vs. week day	12	2%
	Total	581	100%

8. Why do you travel along the US 2 corridor?

People travel the US 2 corridor to access Home and Work, and Commercial/ Businesses. 25% of people said they travel along the US 2 corridor to get home and 11% said they use it for work, for a total of 36% home-work related trips. 26% of people use the US 2 corridor to access Commercial/Businesses, which be work or non-work related trips. This question was asked participants to "check all that apply," therefore, the 13% of people that said they use the US 2 corridor to access Fairchild AFB, may have also checked the option "home" and "other: work." Similarly, the "Casino" option may include people who checked the box for "Home" and the "other: work" options. One can conclude that most people use the US 2 corridor, to access home and work locations, for non-work related errands, and occasional leisurely activities (Table 1.6).

Table 1.6

Q8. Why do you travel along the US 2 corridor?			
Theme Rank	Themes	# of Responses	Percent
1	Commercial/Businesses	294	26%
2	Home	288	25%
3	Fairchild AFB	145	13%
4	Casino	125	11%
5	Other: Work	122	11%
6	Other: Recreation/Family & Friends	54	5%
6	Other: Shopping	27	2%
6	Other: Pass through	23	2%
6	Other: Spokane/1-90	21	2%
6	Other: I Don't	17	1%
6	Other: Food/Drinks	9	1%
6	Other: Airport	8	1%
6	Other: Medical	5	0%
6	Other: School	2	0%
	Total	1140	100%

The remaining 62% of people describe the US 2 corridor as not convenient due largely to the traffic congestion. People described having troubles entering the US 2 corridor when either trying to cross it while sitting in the median, or when leaving a business adjacent to US 2. Many perceive the turn lanes and medians as inconvenient, inhibiting them from accessing the direction or location they desire. Further reasons why people said it is inconvenient to get to places along the US 2 corridor includes, obstacles due to recent constructions, a lack of bicycle and pedestrian facilities, traffic signal timing and roundabouts. People also recognized that driver behavior causes unsafe environment for others along the US 2 corridor (Table 1.5).

Table 1.5

Q7. Is it convenient to get to places along to US 2 corridor? If no, why not?			
Theme Rank	Themes	# of Responses	Percent
1	Yes, if you have a vehicle	204	28%
2	No, traffic congestion	132	18%
3	No, turn lanes & medians (difficult to leave businesses)	87	12%
4	No, difficulty crossing & entering US 2	84	12%
5	Other	50	7%
6	No, construction & roundabouts	42	6%
7	No, traffic signals (too many, not enough, need better timing)	28	4%
8	No, improve multi-modal infrastructure (sidewalks, bus stops)	27	4%
9	I try not to use US 2 or I don't use US 2	23	3%
10	Improve local network	23	3%
11	No, older businesses have limited parking and signage	16	2%
12	No, driver behavior (distracted, too slow, too fast, lack of education)	14	2%
	Total	730	100%

previous question about mobility of non-motorized traffic around the West Plains. People believe that public transportation needs to be improved in and around the West Plains.

Table 1.4

Q6. How could access to public transportation (bus) service in and around the West Plains?			
Theme Rank	Themes	# of Responses	Percent
1	Don't Know/ No Answer/ No Opinion	232	33%
2	More Bus Stops & Move Bus Stops off HWY 2	73	11%
3	More Frequent & Direct Routes & Better Service Time	64	9%
4	More Bus Routes & Increase Service Area	63	9%
5	Other (Light rail, Lime Scooters)	47	7%
6	I Do Not Use Public Transportation	41	6%
7	Service Areas within the West Plains	40	6%
8	Existing Service is Sufficient	35	5%
9	Park and Ride & Transit Center	26	4%
10	Enhance Bicycle and Pedestrian Infrastructure	21	3%
11	Better Shelters	17	2%
12	Better Pull-Out Areas for Buses	15	2%
13	Direct Service Downtown to Fairchild & Airport	11	2%
14	Increase Education & Public Awareness	9	1%
	Total	694	100%

7. Is it convenient to get to places along the US 2 corridor? If not, why?

The US 2 corridor can be convenient if you own a vehicle, but even then, people perceive the US 2 corridor to be difficult to enter and exit safely. The 8 mile segment of the US 2 corridor from the 1-90 interchange to the entrance of Fairchild Air Force Base, encompassed within the *West Plains Subarea Transportation Management Plan* study boundary is used by tens of thousands of people daily. Of the people that responded to the study's main survey, 28% of people found that the US 2 corridor was convenient by automobile. About 3% of people said they try not to use the US 2 corridor, and 7% responded to the question and fell under the "other" theme. The "other" comments did don't fit into any particular theme (Table 1.5).

Table 1.3

Q5. How can walking and biking be improved in and around the West Plains?			
Theme Rank	Themes	# of Responses	Percent
1	Increase Number and Connect Trails & Pathways	202	29%
2	Increase Number and Connect Sidewalks	123	17%
3	Increase Number and Connect Bike Lanes & Shoulders	109	15%
4	Increase Safety (i.e. crossings, lighting, buffers, enforcement, lower speed)	105	15%
5	Add Bicycle & Pedestrian Facilities (parallel to, but away from main roads)	52	7%
6	Increase Density & Destinations (parks, reduce large parking lots, residential too far from businesses, directness)	46	7%
7	Can Not & Should Not Be Improved	34	5%
8	Maintain Existing Bicycle & Pedestrian Facilities (i.e. sweep the streets & sidewalks)	17	2%
9	Other	12	2%
10	Reduce Traffic	6	1%
	Total	706	100%

6. How could access to public transportation (bus) service be improved in and around the West Plains?

Community members that work, live and play in the West Plains, believe that the access to public transportations should be improved, but 33% are not entirely sure how to make that happen and 6% said they do not use public transportation. The other 61% of respondents had a wide range of recommendations. 11% of people suggested increasing the number of bus stops and to move them off of the US 2 corridor. 9% suggested more frequent and direct service offered at addition times (Table 1.4). Others recommended improving the bus shelters and enhancing the bicycle and pedestrian facilities to the bus stops, which directly relates to the

Survey comments describe the environment as visually unattractive. In the same question that asked participants why people work in the West Plains, but do not live there, 13% of people responded that the West Plains was not visually pleasing; it lacks trees, is often windy, the topography is flat and barren, and worse, the water was "poisoned" (Table 1.2). This response described the observable landscape for most people travelling in and around the West Plains. The water crisis in 2017 may have left a negative impression on people or businesses that were considering relocation to the West Plains area. Perhaps this is another facet to the story behind the 2015 census data: people work in the West Plains, but do not live there.

5. How could walking and biking be improved in and around the West Plains?

Survey respondents expressed that walking and biking in the West Plains is not only unsafe due to the lack of bike lanes and connected sidewalks, but in most areas it was nearly impossible unless they were willing to walk on the roadway. According to the survey data, about 61% of people expressed that if the West Plains increased the number of contiguous trails, pathways, sidewalks, bike lanes and road shoulders, then more people would be willing and able to move about the West Plains safely (Table 1.3). Furthermore, bicycle and pedestrian facilities should be equipped with increased safety infrastructure such as lighting, safe crossings, and buffers. People expressed the need for more law enforcement in the West Plains area, specifically to enforce speed limits. Bicycle and pedestrians in the West Plains believe that speeding automobiles adds to their already vulnerable and unhospitable environment (Table 1.3). New or enhanced trails, sidewalks and shoulders can improve the safety of walking and biking around the West Plains.

community and walkable neighborhoods. Community members would like to see a variety of housing options and more middle-income single family units in the West Plains.

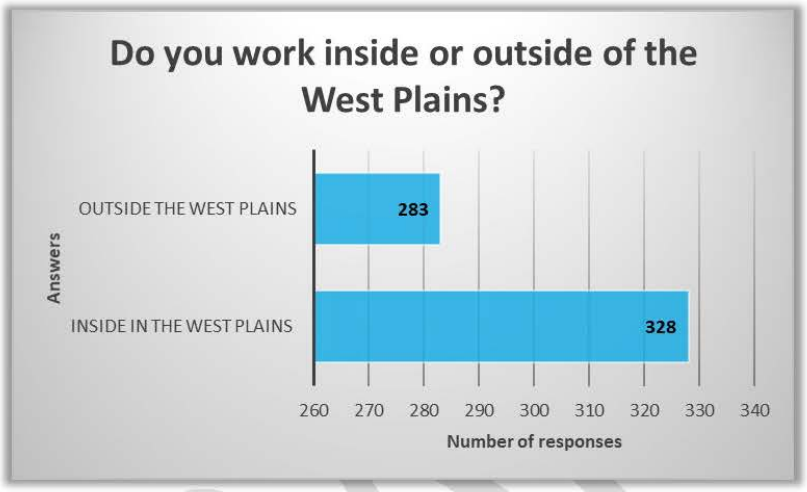
Table 1.2

Q4. Census data shows that 96% of the people that work in the West Plains do not live in the West Plains. Why do you think that is?			
Theme Rank	Themes	# of Responses	Percent
1	Lack of Affordable Housing & Variety (i.e. lack of walkable neighborhoods, and sense of community)	224	29%
2	Lack of Amenities (i.e. shopping, groceries, services, resources, medical, entertainment and activities)	102	13%
3	Overall Attractiveness & Environmental Factor (i.e. no trees, poison water, too windy)	100	13%
4	Land Uses (i.e. heavy industrial, agriculture, rural town, sprawl)	81	11%
5	Other	69	9%
6	Misconceptions about Airway & People Commute From Spokane	58	8%
7	Job Variety & Availability	44	6%
8	Proximity to Air Force Base & Airport (i.e. air traffic noise, pollution)	23	3%
9	Traffic Congestion, Poorly Maintained Road Infrastructure & Lack of Multimodal Options	23	3%
10	Safety Issues (i.e. drugs, crime)	15	2%
11	Proximity to Correctional Facility	12	2%
12	Lack of Choice Schools & Child Care	10	1%
	Total	761	100%

In addition to affordable housing, 13% of people said the West Plains lacks necessary amenities and resources (Table 1.2). The West Plains, particularly Airway Heights, has large box retail stores and entertainment such as a Movie Theater and Casinos. People express that the West Plains lacks a variety of shopping and grocery options, family recreational activities both indoor and outdoor, medical facilities and other services.

inside the West Plains may be either be physically located or travel in and around the West Plains for work related activities (Figure 1.2).

Figure 1.2



4. 96% of people that work in the West Plains do not live in the West Plains. Why do you think that is?

On The Map Census Data from 2015, shows that 96% of people who work with in the *West Plains Subarea Management Plan* study boundary, don't live within the study boundary. WSDOT and partners asked the West Plains communities why that might be. The survey shows 29% of comments express that there is an issue with the amount and variety of housing options (Table 1.2). This includes a lack of affordable housing options when compared to other areas like Spokane, WA. Survey comments explain, the selection of housing options available in the West Plains includes mostly apartments or trailers, or is in poor condition, likely referring to the area of Airway Heights. Additionally, feedback indicates that the West Plains lacks a sense of