D.14 INDIRECT AND CUMULATIVE IMPACTS

Spaghetti Bowl Project
Indirect and Cumulative Impacts Technical Report

As part of the Environmental Review Process for

I-80/I-580/US 395
Spaghetti Bowl Interchange Reconstruction
Washoe County, Nevada

Federal Highway Administration, Nevada Division

Nevada Department of Transportation

NDOT Project Number 74020
FHWA Project Number NHFP-080-1(172)

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AMI	area median income
APE	area of potential effect
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
MSA	Metropolitan Statistical Area
NCHRP	National Cooperative Highway Research Program
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
PUD	planned unit development
RTAA	Reno-Tahoe Airport Authority
RTC	Regional Transportation Commission of Washoe County
Spaghetti Bowl	I-80/I-580/US 395 Freeway to Freeway Interchange
TAZ	Traffic Analysis Zone
TMRPA	Truckee Meadows Regional Planning Agency
TMSA	Truckee Meadows Service Area
TRIC	Tahoe Reno Industrial Center
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended
USFWS	U.S. Fish and Wildlife Service

1 INTRODUCTION

1.1 PROJECT OVERVIEW AND NEED FOR THE PROJECT

The Spaghetti Bowl (Interstate 80/Interstate 580/U.S. Highway 395 [I-80/I-580/US 395]) is a freeway-to-freeway interchange that was constructed between 1969 and 1971, when Washoe County had a population of about 130,000 people. At that time, about 90,000 vehicles per day used the Spaghetti Bowl. In 2015, the combined population of Reno and Sparks was about 327,000 people and the population of Washoe County was about 435,000 people (U.S. Census Bureau 2017). About 260,000 vehicles per day used the Spaghetti Bowl in 2016, making it the busiest interchange in northern Nevada.

The Spaghetti Bowl's 1960s-era design is obsolete for several reasons:

- Interchange ramps are spaced too closely to one another. Vehicles entering or exiting the freeway at these closely spaced interchanges must cross paths with other vehicles traveling in the same direction, sometimes across two or more lanes of traffic, which is referred to as weaving. In general, short "weave segments," like those found in the Spaghetti Bowl, result in increased congestion.

- There are five locations on I-80, I-580, and US 395 in and around the Spaghetti Bowl where a freeway lane ends. These "lane drops" are bottlenecks that cause congestion.

- There are four low-speed ramps in the Spaghetti Bowl that do not have the capacity to accommodate existing traffic volumes. These low-speed ramps are bottlenecks and are regularly congested during rush hour.

- There are multiple locations throughout the length of I-80, I-580, and US 395 where design guidelines and standards are no longer met. These locations result from design exceptions incorporated into prior projects and changes to design guidelines and standards applicable to the freeways. These affect some travelers' ability to navigate the project limits comfortably at speed, adding to congestion.

These deficiencies create congestion, contribute to a higher-than-average crash rate, and delay drivers. Based on data Nevada Department of Transportation (NDOT) prepared for the *Spaghetti Bowl Project Draft Environmental Impact Statement* (EIS), there is on average one injury crash in or around the Spaghetti Bowl each day. The average delay for drivers is anticipated to increase by 53 percent between 2016 and 2040 if no improvements are made to the freeway system in the project area. The Spaghetti Bowl Reconstruction Project (Spaghetti Bowl Project; project) is designed to address the obsolete design of the interchange, improve safety, and reduce travel delays by eliminating lane drops, improving ramp spacing, and

replacing the low-speed loop ramps with new ramps that have more capacity and allow safe travel at higher speeds.

The project area encompasses the area within which the proposed construction would occur and includes the Spaghetti Bowl, each of the four legs of the freeway-to-freeway system, the freeway-to-freeway system interchange, and 16 service interchanges that connect the freeways to local roads.

The project is in Washoe County, Nevada, within the cities of Reno and Sparks, and has the following limits:

- I-80 between Keystone Avenue on the west and McCarran Boulevard on the east, a distance of approximately 5 miles.
- I-580/US 395 between Meadowood Mall Way on the south and Parr Avenue/Dandini Boulevard on the north, a distance of approximately 7 miles (Figure 1-1).

The purpose of this technical memorandum is to describe the potential indirect and cumulative environmental effects that could result from implementation of the Spaghetti Bowl Project, as required by the National Environmental Policy Act (NEPA). This technical memorandum is divided into two parts: the first half describes indirect effects, and the second half describes cumulative impacts.

The lead agencies for this project are NDOT and the Federal Highway Administration (FHWA).

1.2 PROPOSED ACTION

NDOT and the FHWA are studying several alternatives along I-580/US 395 from the Meadowood Mall Way interchange on the south to the Parr Boulevard/Dandini Boulevard interchange on the north and along I-80 between Keystone Avenue on the west and McCarran Boulevard on the east. The alternatives would bring the freeway up to current standards, improve operations and safety, and increase capacity at spot locations. They would also reduce travel delays in the I-80 and I-580/US 395 corridors and in the freeway-to-freeway interchange that connects these two freeways (known locally as the “Spaghetti Bowl”). Reconstruction of the interchanges could include new or modified ramps and frontage roads on new alignments.

1.2.1 Description of Alternatives

Three preliminary project alternatives are being considered and are presented on the following pages. It is possible that NDOT will refine these alternatives as they are analyzed for impacts and reviewed by the participating agencies, cooperating agencies, and the public.

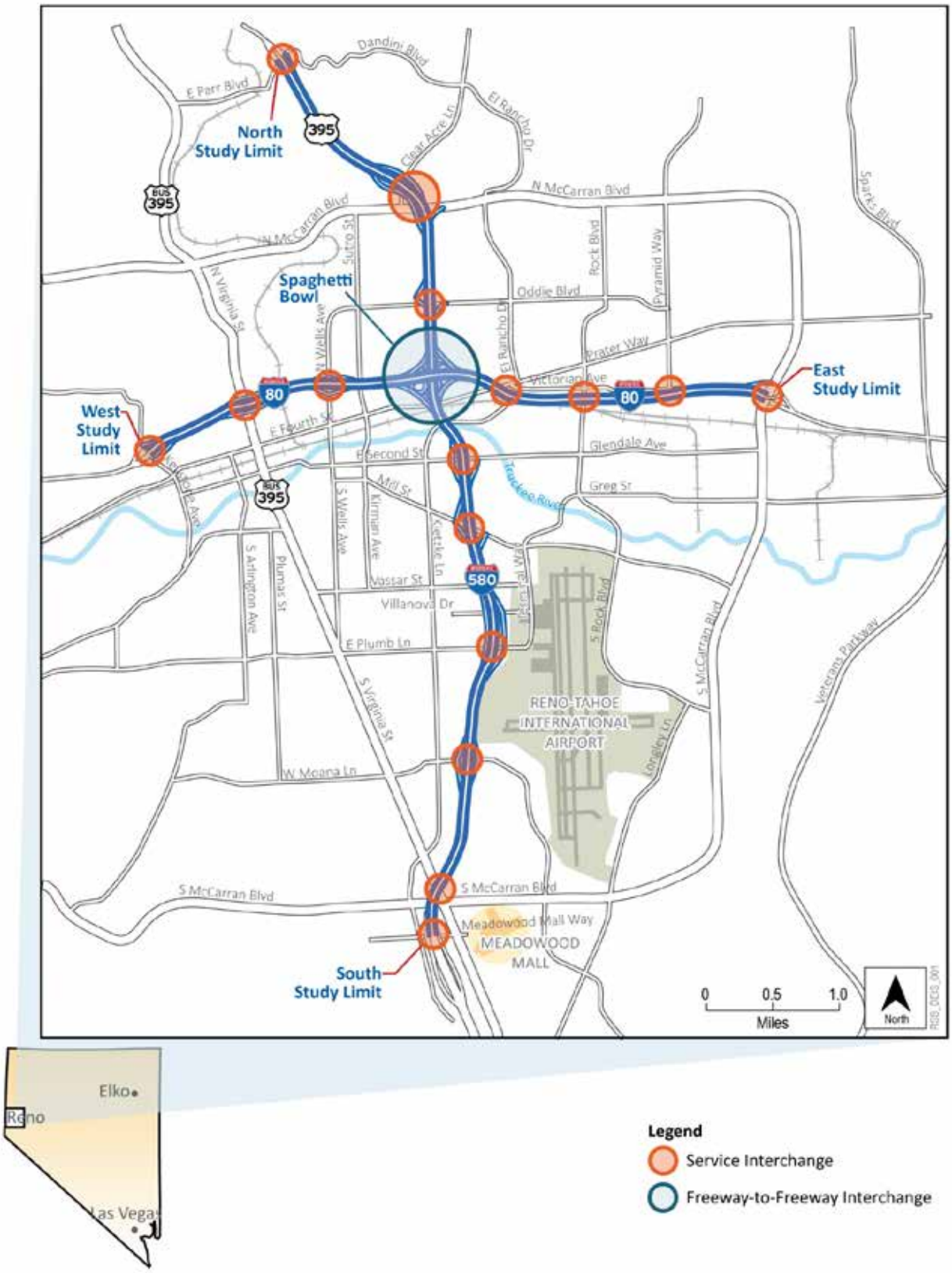


Figure 1-1. Project Limits

1.2.2 No Build Alternative

The No Build Alternative does not include any safety or capacity improvements on the study area freeway system. Only routine maintenance would be performed on I-80 and I-580/US 395. Other planned transportation improvement projects in the study area may still move forward if NDOT decides not to reconstruct I-80 and I-580/US 395.

1.2.3 Alternative 1

Alternative 1 would keep all existing access between the local roads and freeway system while maximizing traffic movement through the Spaghetti Bowl interchange by:

- Using longer sweeping ramps with more gradual curves to increase ramp speed (up to 50 miles per hour) in the Spaghetti Bowl. This would increase the footprint of the interchange compared to its current footprint.

- Reconstructing the Wells Avenue, Oddie Boulevard, Second Street/Glendale Avenue, Mill Street, Prater Way, Rock Boulevard, and Pyramid Way interchanges into configurations that "braid" (see inset for a description of braided ramps).

Braided Ramps

Weaving refers to freeway traffic entering and leaving the freeway in close proximity and resulting in vehicle paths crossing each other. Ramp braids are freeway on and off ramps that are close to one another and are built so one ramp crosses over the other. Ramp braids eliminate the weaving that would otherwise occur.

1.2.4 Alternative 2

Alternative 2 would modify the access between the local roads and freeway system, and it would reduce the project footprint compared to Alternative 1, by:

- Reconstructing the Spaghetti Bowl into a configuration similar to the existing configuration, including converting the south-to-east and north-to-west low-speed loop ramps to longer ramps with more gradual curves that allow higher speeds and increase capacity to meet or exceed the minimum design speed standards.

- Reconstructing the Wells Avenue and Oddie Boulevard interchange so that its on- and off-ramps are braided with the adjacent Spaghetti Bowl ramps. At these locations, freeway access would be limited to the freeway on which the interchange is located. The Oddie Boulevard interchange would provide access to US 395, and the Wells Avenue interchange would provide access to I-80.

- Reconstructing the Second Street/Glendale Avenue interchange and then braiding the ramps with the adjacent Spaghetti Bowl ramps and Mill Street ramps.

- Relocating the I-80/Fourth Street/Prater Way interchange and the Rock Boulevard interchange to Kietzke Lane and then braiding the Kietzke Lane interchange on- and off-ramps with the adjacent Spaghetti Bowl ramps.

- Reducing the Spaghetti Bowl's footprint compared to Alternative 1 by modifying interchanges and reducing on- and off-ramp connections.

1.2.5 Alternative 3

Alternative 3 would modify the access between the local roads and freeway system and reduce the project footprint compared to Alternative 1 and Alternative 2 by:

- Reconstructing the system interchange into a configuration similar to the existing configuration, while increasing capacity to meet or exceed the minimum design standards.

- Reconstructing the Wells Avenue, Oddie Boulevard, and Second Street/Glendale Avenue interchanges as partial clover loop ramp configurations to increase interchange separation between those interchanges and the Spaghetti Bowl.

- Eliminating the I-580/Fourth Street/Prater Way interchange to increase interchange separation from Rock Boulevard.

- Modifying the Mill Street interchange to access I-580 indirectly via frontage road connections to the Second Street/Glendale Avenue interchange to increase interchange separation from the Spaghetti Bowl and Plumb Lane.

- Reducing the project footprint, compared to Alternative 2 and Alternative 3, by modifying service interchanges to increase spacing and minimize the need for ramp braiding.

2 INDIRECT EFFECTS ANALYSIS

The Council on Environmental Quality (CEQ) defines indirect effects as project impacts "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 Code of Federal Regulations [CFR] 1508.08).

Several guidance documents were used to guide the analysis, including:

- American Association of State Highway and Transportation Officials, Practitioner's Handbook 12, Assessing Indirect Effects and Cumulative Impacts Under NEPA (2016)
- CEQ (40 CFR 1500-1508)
- FHWA, Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents (1987)
- FHWA, Secondary and Cumulative Impact Assessment in the Highway Development Process (April 1992)
- FHWA, Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process (2003)
- National Cooperative Highway Research Program (NCHRP), Report 466, Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects (2002)
- NCHRP, Transportation Research Board. Project 25-25, Task 22: Forecasting Indirect Land Use Effects of Transportation Projects (December 2007)

In NCHRP Report 466 (2002), the Transportation Research Board identifies three broad categories of indirect effects:

1. Encroachment-Alteration Impacts: Alteration of the behavior and functioning of the affected environment caused by project encroachment (physical, biological, socioeconomics) on the environment. These effects are caused by the proposed action but occur later in time or farther removed in distance. One example of an encroachment effect identified in American Association of State Highway and Transportation Officials' (AASHTO) *Practitioner's Handbook 12* (2016) is a long-term decline in the viability of a population of a particular species as a result of habitat fragmentation caused by the project.

2. Induced Growth Impacts: Project-influenced development related to improved accessibility to an area, which may change land use, promote development, or influence an increase in the rate of development. One example of an induced growth impact identified in AASHTO's *Practitioner's Handbook 12* (2016) is commercial development occurring around a new interchange.

3. Impacts Related to Induced Growth: Effects related to project-influenced development (impacts of the change in land use) on the human and natural environment. These effects are caused by induced growth or the future land use changes—for example, the environmental impacts associated with commercial development occurring around a new interchange (AASHTO 2016).

2.1 METHODOLOGY

There is no single, standard method for analyzing indirect effects. NDOT considered the magnitude of potential induced-growth effects and the other factors; a combination of "collaborative judgment" and "planning judgement," defined below, provided the most appropriate methodology for analyzing indirect effects.

- The "collaborative judgement" or expert panel technique is cited in the NCHRP *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (2002) as one method to assess indirect effects. This technique helps assess indirect effects by providing local insight from those who have expertise on regional development as it relates to the potential for growth within the area of potential effect (APE), with and without the project, as well as general strategies for managing growth and development. The key benefit of an expert panel approach is it allows for input outside of the study team, which helps improve the quality of the analysis.

- The "planning judgement" method relies on the experience of the practitioner, the relevant planning literature, and on an assessment of local trends and forecasts to assess indirect land use effects.

The process for assessing indirect effects uses the following six steps:

- Step 1: Perform scoping to identify APE and analysis timeframe
- Step 2: Identify the study area's direction and goals
- Step 3: Inventory notable features in the study area
- Step 4: Identify impact-causing activities
- Step 5: Assess potentially substantial indirect effects
- Step 6: Assess potential minimization and mitigation measures

The sections below describe each of these six steps.

2.2 STEP 1: PERFORM SCOPING TO IDENTIFY AREA OF POTENTIAL EFFECT AND ANALYSIS TIMEFRAME

The first step of the analysis had three overall goals:

- Gather information on the issues to be evaluated in the analysis
- Determine the location and extent of the indirect impacts study area (i.e., the APE)
- Determine time horizon for analysis

2.2.1 Scoping and Expert Panel Interviews

At an agency scoping meeting[1] held on April 12, 2017, NDOT reviewed the following:

- Project actions
- Purpose and need
- Impact analysis methodologies
- Tribal, agency, and public coordination
- Project timeline and milestones

The Reno-Sparks Indian Colony and the U.S. Environmental Protection Agency provided input on the indirect and cumulative impact analyses in scoping letters (see Attachment 1), which this analysis accounted for in considering potential impacts.

Additionally, two public scoping meetings were held on April 12 and 13, 2017. No comments related to indirect and cumulative impacts were received.

NDOT assembled an expert panel in December 2017, consisting of local planners, developers, realtors, and university staff who are knowledgeable of growth and development activities in the region, including representatives from:

- Truckee Meadows Regional Planning Agency
- Regional Transportation Commission of Washoe County (RTC)
- Reno-Sparks Indian Colony
- Commercial Real Estate Development Association
- University of Nevada, Reno

NDOT interviewed the expert panel members separately and used their input to identify available information and data, as well as major indirect effect issues (see Attachment 2).

[1] The scoping process involves the public, local government, Native American tribes, and regulatory agencies on the scope of issues to be addressed in the environmental review process. NDOT held two public scoping meetings and one agency scoping meeting in April 2017.

2.2.2 Determining Area of Potential Effect

The APE is the geographic area that may experience indirect effects from the proposed project. The boundaries for the analysis need to extend beyond the potential footprint of the improvements, since indirect effects can occur at some distance from a proposed project. NDOT considered a combination of accepted approaches for delineating the indirect effects APE, including political boundaries, resources boundaries, stakeholder input, professional judgement, and data collection.

The indirect effects analysis APE was divided into a primary APE (primary study area) and a secondary APE (secondary study area). The primary APE, illustrated in Figure 2-1, identifies the locations that have the greatest likelihood for indirect effects. The primary APE is generally 0.25 mile from the existing right-of-way boundary, except where resource boundaries and potential commuter travel-time savings[2] broadened the boundary. It encompasses the social, historic, and natural resources that are most directly served by the freeway and its interchanges, an area may be most susceptible to changes in access. Because the area is highly urbanized, a 0.25-mile primary APE boundary is sufficient to capture changes in access and mobility. Stakeholders from local planning agencies reviewed the primary APE boundary (see Attachment 2). The Reno-Sparks Indian Colony recommended including Kietzke Lane to the west of the Colony.

The secondary APE, shown in Figure 2-2, illustrates the areas to be evaluated for broader land use trends the project may influence. The secondary APE is approximately 280 square miles and largely matches the Truckee Meadows Service Area (TMSA).[3] The TMSA is the area within which the Truckee Meadows Regional Planning Agency (TMRPA) anticipates future growth to occur, and in which it has committed to providing municipal services and infrastructure (i.e., potable water supply, reclaimed water supply, sanitary sewer, flood management, transportation, public safety, parks, and schools) to support development. Therefore, the TMSA captures the area within which potential indirect land use effects may occur.

[2] American Association of State Highway and Transportation Officials guidance (2007) indicates the potential for land use change is probably very strong if the change in travel time is more than 10 minutes. NDOT traffic modeling identified a potential for travel times to decrease about 10 minutes for the 5-mile trip from the south project limit to the north project limit (Meadowood Mall Way to Parr/Dandini Boulevard) on I-580/US 395 in 2040.

[3] There are two noncontiguous areas within the region, Spring Mountain and Warm Springs, that are not included in the secondary APE because they are removed in distance from the Reno/Sparks service areas. Fewer than 60 housing units are predicted to be built in these areas by 2035 (TMRPA 2017).

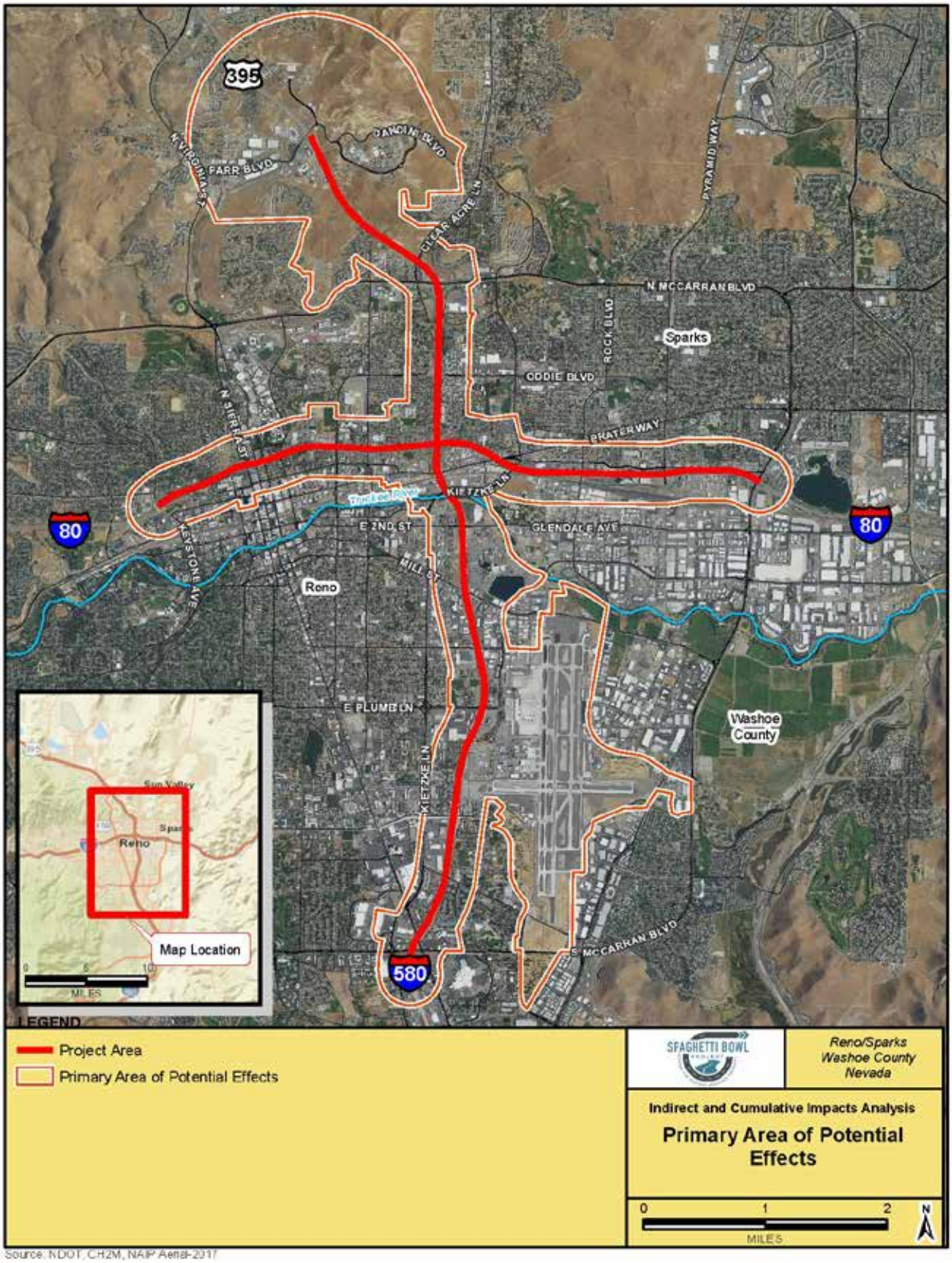


Figure 2-1. Primary APE

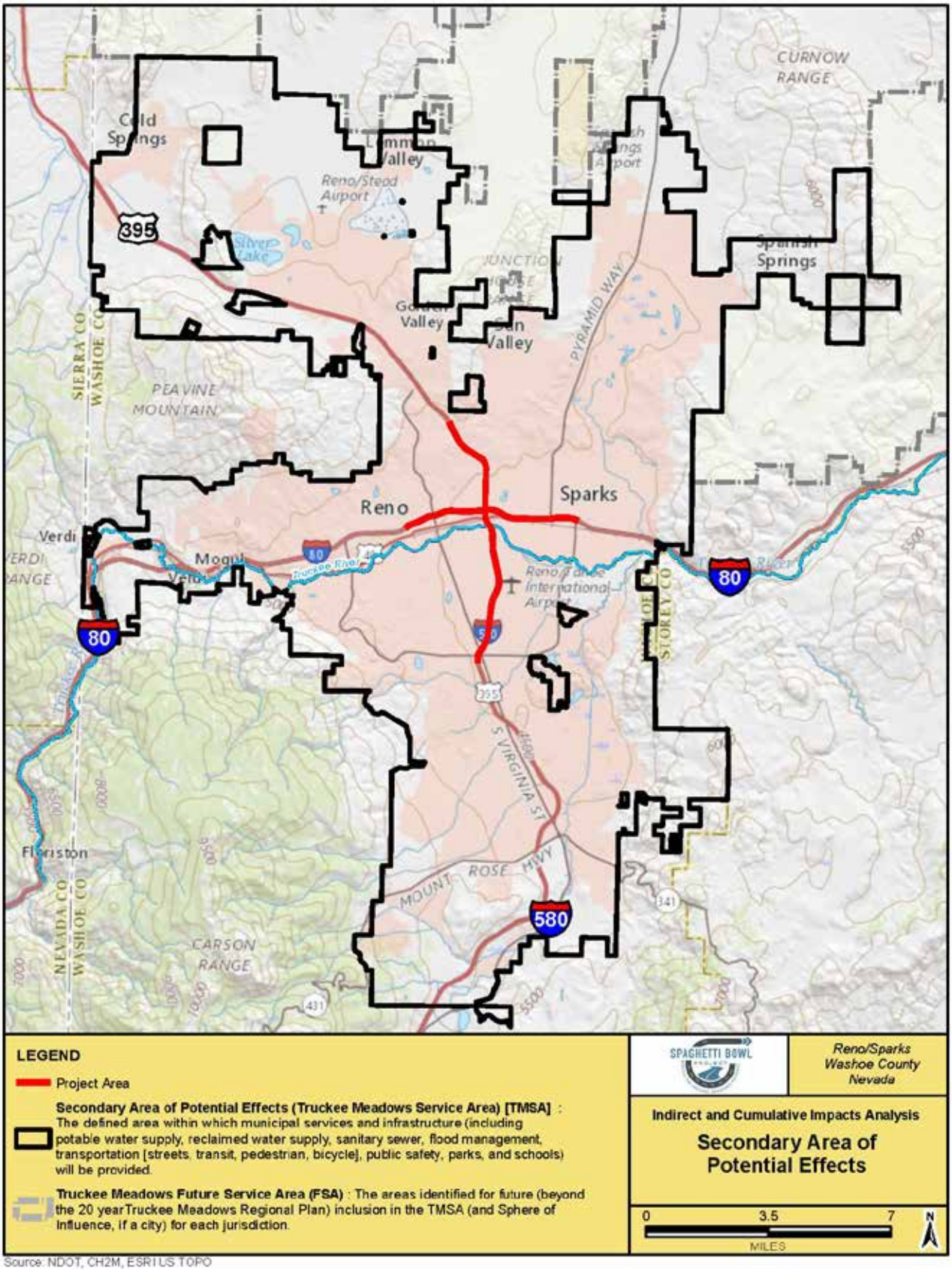


Figure 2-2. Secondary APE

2.2.3 Analysis Timeframe

Determining a timeframe for the analysis is important because land use and economic impacts related to transportation projects can occur over time, and those different impacts can appear at different times. According to NCHRP Report 466, the timeframe for an indirect effects analysis should be short enough in duration to anticipate reasonably foreseeable events but also long enough to capture changes that may occur over several business cycles (NCHRP 2002). NCHRP Report 466 states that most indirect effects assessments set a time horizon equal to the typical transportation planning horizon of about 20 to 25 years. Based on the guidance and information collected during the scoping process, the timeframe for this indirect effects analysis is 2040, which is consistent with the planning horizons used for regional land use and transportation planning purposes.

The relevant regional documents and plans used to anticipate conditions in 2040 include the following:

- Reno-Sparks Indian Colony Master Plan/Land Use Plan (1998)
- Truckee Meadows Regional Plan (2012 – 2032)[4]
- RTC, 2040 Regional Transportation Plan (2017)
  - RTC TransCAD Activity-Based Travel Demand Model Population/Employment Forecasts (2015-2040)[5]
- Washoe County Master Plan (2010)
  - Washoe County Consensus Forecast (2016-2036)[6]
- City of Reno Master Plan (Reimagine Reno) (2017a)
- City of Sparks Comprehensive Plan (Ignite Sparks, The Plan Guiding the City of Sparks to the Year 2030)
- University of Nevada, Reno, Campus Master Plan (2015-2024)

[4] The 2017 Regional Transportation Plan Update is expected to be released in May 2018 (2017 – 2037)

[5] The RTC TransCAD activity-based travel demand model incorporates demographic data from the 2010 U.S. Census, 2015 American Community Survey, and 2016 Washoe County Consensus Forecasts for population and employment developed by the TMRPA.

[6] The Washoe County Consensus Forecast is required to be updated every two years. In September 2018, following publication of the Draft EIS, the 2018-2038 forecast was published. The updated consensus forecast has been reviewed with respect to the analysis and conclusion identified in this technical memorandum.

- Reno-Tahoe International Airport, Master Plan (2018)
- Reno-Stead Airport Master Plan Update (2010)

2.3 STEP 2: IDENTIFY THE STUDY AREA'S DIRECTION AND GOALS

Comprehensive, regional, and local plans provide insight to the social, economic, ecological, and growth-related aspirations of a community. Understanding community goals and aspirations within the APE, particularly those that guide or restrict future development, provides a basis for assessing project compatibility and potential impacts. Figure 2-3 illustrates the jurisdictional boundaries of planning, management, and transportation-related agencies in the region and the Reno-Sparks Indian Colony.

2.3.1 Truckee Meadows Regional Planning Agency

The Truckee Meadows Regional Plan (TMRPA 2013), adopted July 18, 2013, establishes the following goals:

- More efficiently use land, natural resources, and community services
- Save money on infrastructure
- Reduce dependence on the private automobile
- Promote multimodal transportation choices
- Protect air quality
- Conserve energy
- Preserve designated open space
- Create more affordable communities.

To achieve these goals, the Truckee Meadows Regional Plan (TMRPA 2013) establishes policies to limit the spread of the urban footprint and direct more development of homes and jobs toward the traditional core of the region, while promoting infill[7] where it enhances the community, including but not limited to downtowns, designated centers, transit corridors, and redevelopment areas. This strategy will result in more compact, mixed-use development.[8]

[7] Infill is development or redevelopment of land that has been bypassed, remained vacant, and/or is underused as a result of the continuing urban development process. Generally, the areas and/or sites are not of prime quality; however, they are usually served by or are readily accessible to infrastructure (TMRPA 2013).

[8] Mixed-use development is a single building or land containing more than one type of land use, or single development of more than one building and use, where the different types of land uses are near each other, planned as a unified, complementary whole, and functionally integrated to the use of shared vehicular and pedestrian access and parking areas (TMRPA 2013).

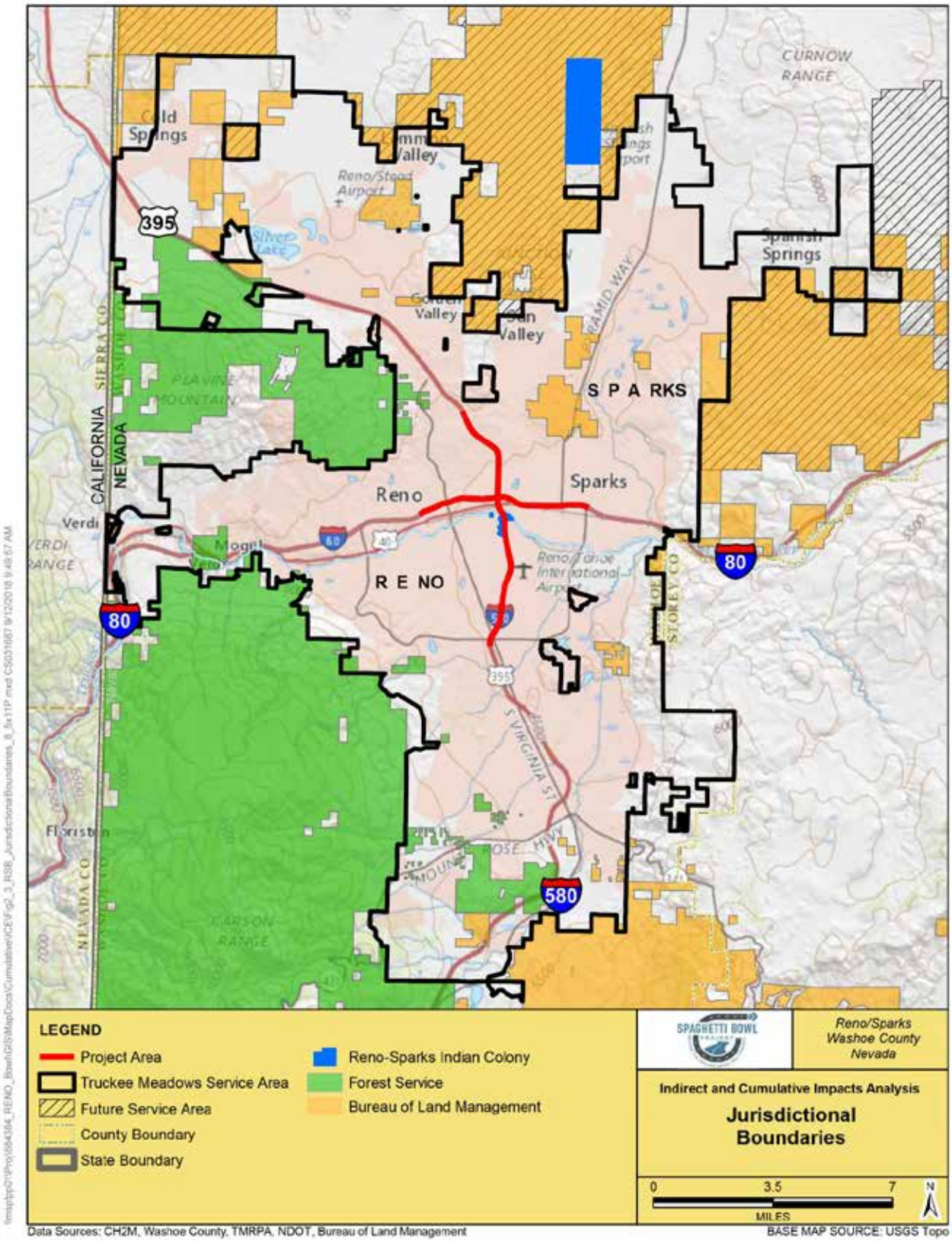


Figure 2-3. Jurisdictional Boundaries

2.3.2 Regional Transportation Commission of Washoe County

The RTC aims to improve the region's quality of life by achieving clean air, making roads accessible to all regardless of age or ability, and providing transportation options. The 2040 Regional Transportation Plan, adopted May 18, 2017, establishes the following goals, which highlight the areas where transportation investments can improve quality of life for the region (RTC 2017):

- Improve safety
- Integrate land use and economic development
- Promote healthy communities and sustainability
- Manage existing systems efficiently
- Integrate all types of transportation
- Focus on regional connectivity
- Promote equity and environmental justice
- Improve freight and goods movement
- Invest strategically

The RTC supports the policies of the Truckee Meadows Regional Plan, including transit-oriented development, compact development, infill development, and complete streets.[9] These policies facilitate a more connected, multimodal transportation system. The 2040 Regional Transportation Plan is in conformance with the Truckee Meadows Regional Plan. Attachments 3 and 4 contain email correspondence with the Regional Transportation Commission of Washoe County.

2.3.3 Washoe County

The Washoe County Master Plan (2010) guides future growth into patterns that create sustainable communities that balance economic opportunities and environmental quality, promote efficient use of land and public infrastructure while offering a variety of lifestyle choices, support alternate modes of transportation, and create safe and well-designed communities. Washoe County supports the following land use and transportation strategies:

- Mixed-use development
- Infill development, where infrastructure is available
- A range of housing choices
- Interconnected, walkable streets
- Conservation of natural resources and public lands, as well as access to open space

[9] Complete Streets are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. A complete street may include sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible public transportation stops, frequent and safe crossing opportunities, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, and roundabouts (Smart Growth America undated).

The Washoe County Master Plan is in conformance with the Truckee Meadows Regional Plan.

2.3.4 City of Reno

The City of Reno Master Plan, *Reimagine Reno,* adopted December 13, 2017, is in conformance with the Truckee Meadows Regional Plan and establishes eight guiding principles:

1. Resilient local and regional economy
2. Responsible and well-managed growth
3. Thriving downtown and university district
4. Vibrant neighborhoods and centers
5. Well-connected city and region
6. Safe, healthy, and inclusive community
7. Quality place and outdoor recreation opportunities
8. Effective government

The City of Reno's Master Plan (2017a) encourages higher density infill development, transit-oriented development, and walkable, mixed-use communities, particularly in the downtown.

2.3.5 City of Sparks

The City of Sparks Comprehensive Plan, *Ignite Sparks* (2016) is in conformance with the Truckee Meadows Regional Plan. The City's comprehensive plan provides for the efficient use of land and resources, encourages infill and redevelopment, fosters economic vitality, and facilitates multimodal transportation between land uses. The comprehensive plan promotes a diverse and integrated mix of land uses, a revitalized downtown district at Victorian Square, and emerging employment centers (i.e., Spanish Springs and East Sparks). Additionally, the City aims to preserve its parks and open space areas by replacing equivalent facilities when City parks are eliminated due to development.

2.3.6 Bureau of Land Management

The Bureau of Land Management manages nearly 48 million acres of public land for multiple uses in Nevada, which accounts for about 67 percent of the state's land base. In Nevada, the Bureau of Land Management ensures that grazing, mining, and energy development on public land are sustainable and compatible with other land uses. The Bureau of Land Management also manages wildland fire, wild horse and burro populations, recreation, and National Conservation Lands. Other programs include Special Recreation Permits to facilitate unique land uses, such as commercial, competitive, and organized group events. The Bureau of Land Management Nevada also has a land and realty program that manages leases, sales, and exchanges of public land (Bureau of Land Management undated-a).

The Bureau of Land Management's priorities are consistent with the themes and related goals of the Administration and Federal Land Policy and Management Act (Bureau of Land Management undated-b). Applicable priorities include:

- Create a conservation stewardship legacy second only to Teddy Roosevelt
- Sustainably develop energy and natural resources

There are no Bureau of Land Management lands within the primary APE, but there are approximately 14 square miles within the secondary APE. Bureau of Land Management lands are primarily on the periphery of the secondary APE, beyond the traditional core, and are undevelopable due to federal land designation and/or steep slopes.

A new federal lands bill, the Washoe County Economic Development and Conservation Act, seeks to enable smart growth and protect open space. Eighty-three percent of Washoe County is federally owned (Washoe County 2018). The bill allows for approximately 160,000 acres of federal land (Bureau of Land Management and U.S. Forest Service) in Washoe County to be available for sale through a competitive bidding process. There are approximately 9,256 acres of Bureau of Land Management lands and 9,045 acres of Forest Service lands within the secondary APE. The federal lands bill covers most of the Bureau of Land Management lands within the secondary APE. It offers solutions by authorizing:

- Land conveyances for public purposes
- Land sales and land exchanges within the disposal boundary for potential development
- Designation of areas as Wilderness Areas
- Designation of areas as National Conservation Areas
- Release of lands not designated as Wilderness Study Areas

The Act will give Washoe County more say on when and where development takes place, as well as some proceeds from the land sales. A final plan has not been formulated. The final plan will need to be approved by the Washoe County Commission and the U.S. Congress, and signed by the President (Russell 2018).

2.3.7 University of Nevada, Reno

The University of Nevada, Reno, Board of Regents approved the Campus Master Plan in December of 2014. The Campus Master Plan (University of Nevada, Reno 2014) identifies the following objectives to support the goals of the university:

- Strengthen the unique character of academic subareas within the campus while maintaining connectivity.

- Promote an integrated circulation system that improves access to and within the campus, giving priority to pedestrians, followed by bicyclists, transit, maintenance, and private vehicles.
- Create a gracious gesture to neighbors on all boundaries of the campus by improving key campus entries, especially along North Virginia Street and Evans Avenue.
- Foster the development of a mixed-use, vibrant university town adjacent to the campus, and reinforce its connection to downtown Reno through use adjacencies and urban design.

The 10-year Campus Master Plan (University of Nevada, Reno 2014) identifies the investments the university will need to serve students long-term, including:

- Expanding research facilities
- Expanding physical fitness facilities and fields
- Renovating buildings
- Enhancing key university entrances
- Acquiring a nearby Washoe County School District property
- Creating a Campus Gateway Precinct and University District (part of the effort to revitalize the land between I-80 and downtown Reno)

2.3.8 Reno-Tahoe International Airport

The Reno-Tahoe International Airport, operated by the Reno-Tahoe Airport Authority (RTAA), is a medium hub commercial service airport. Because the RTAA provides planning and facilities related to transportation services within Washoe County, its *Regional Plan Goals & Policies of the Reno-Tahoe International Airport* plan (2013) needs to be in conformance with the Truckee Meadows Regional Plan. On March 12, 2014, the Regional Planning Commission of Washoe County found the plan to be in conformance with the Truckee Meadows Regional Plan (RTAA 2013a).

The Reno-Tahoe International Airport is included in the City of Reno's Master Plan and has a land use designation of Special Planning Area. Some of the key requirements identified in the City of Reno's Regional Center Plan for the Reno-Tahoe International Airport (City of Reno 2007) are:

- Increase job capacity within the McCarran Boulevard ring road.
- Require mixed uses through amendments of zoning code and best practices development guidelines for centers and corridors.

- Promote compatibility between new development and regional airport operations, in consultation with the RTAA.
- Adapt appropriate development standards.

The RTAA recently completed its master plan to address airport growth, aviation industry changes, and Federal Aviation Administration standards for the next 20 years. There are three focus areas for the master plan (RTAA 2018):

- Airfield enhancements of runways, taxiways, aprons, and airspace
- Terminal modernization of ticketing, gates, customs, concessions, and baggage
- Ground transportation extending to roads, parking, airport land use, and more

2.3.9 Reno-Stead Airport

The Reno-Stead Airport, operated by RTAA, is a public and military general aviation airport in the North Valleys area. It is a reliever airport to the Reno-Tahoe International Airport. Because the RTAA provides planning and facilities related to transportation services within Washoe County, its *Regional Plan Goals & Policies of the Reno-Stead Airport* plan needs to be in conformance with the Truckee Meadows Regional Plan. On March 12, 2014, the Regional Planning Commission of Washoe County found the plan to be in conformance with the Truckee Meadows Regional Plan (RTAA 2013b).

The Reno-Stead Airport is included in the City of Reno's Master Plan and has a land use designation of Special Planning Area. Some of the key requirements identified in the City of Reno's Regional Center Plan for the Reno-Stead Airport include (City of Reno 2003):

- Require mixed uses through amendments of zoning code.
- Promote compatibility of new development, in consultation with the Airport Authority of Washoe County, with regional airport operations.
- Adapt appropriate development standard (e.g., parking standard reductions).

The Reno-Stead Airport Master Plan Update was approved in March 2010 (RTAA 2010). The plan serves as a management guide for the implementation of improvements needed to meet the aviation demand at the Reno-Stead Airport through 2028. The Master Plan identifies six goals:

- Provide an airport that is safe, secure, and reliable, while continuing to maintain the existing high level of service provided to all Reno-Stead Airport users and tenants.
- Provide planning and development guidance to satisfy anticipated aviation demand and to promote fiscal self-sufficiency by stimulating Reno-Stead Airport development and the local economy.

- Minimize or avoid any negative environmental impacts from proposed development.
- Promote the development of appropriate and achievable compatible nonaviation land use in undeveloped areas within the Reno-Stead Airport.
- Address infrastructure needs and local drainage issues at Reno-Stead Airport.
- Identify an appropriate development phasing program in association with the airport land use and development plan.

2.3.10 Reno-Sparks Indian Colony

The Reno-Sparks Indian Colony Master Plan/Land Use Plan, adopted in 1998, guides development through 2027 for all Reno-Sparks Indian Colony existing land parcels, as well as development for land parcels to be acquired in the future. Reservation land in downtown Reno consists of a 69-acre area adjacent to I-580 between the Truckee River and Mill Street. The land uses include a mixture of institutional, residential, and commercial development. Reno-Sparks Indian Colony lands also consist of 15,263 acres in Hungry Valley, 19 miles north of downtown Reno. About 93 percent of the Hungry Valley Reservation is unused; the parcel hosts a small subdivision of 150 homes, along with a gym, community center, and Head Start Program for children. With steep slopes, flooding drainages, and rocky or expansive clay soils, most of the parcel will be devoted to uses such as hiking, biking, horseback riding, day parking of vehicles in designated areas, geocaching, and cross-country running (Reno-Sparks Indian Colony undated). Although Hungry Valley is outside the secondary APE, the Reno-Sparks Indian Colony operates a daily transit service for residents to access services in Reno.

The following information about the Reno-Sparks Indian Colony is from the Colony Road Master Plan/Land Use Plan (1998):

- **Land acquisition:** To "meet economic, social, and health needs of the Tribal membership, as well as to exercise its constitutional obligation to promote the general welfare of the Tribe," the Tribal Council has established a policy of land acquisition. Land in northwest Warm Springs Valley and Winnemucca Valley is specifically mentioned as a target area for acquisition.[10]
- **Sphere of influence:** Sphere of influence refers to a proposed plan for the probable physical boundaries and service area of the Reno-Sparks Indian Colony, and the area around Colony land holdings. The spheres are used to discourage the concentration of heavy industry on its residential boundaries, retain open space, the proliferation of local government agencies, and encourage efficiency, economy, and orderly changes in local government.

[10] The Hungry Valley lands, and northwest Warm Springs Valley and Winnemucca Valley, are outside the secondary APE.

2.4 STEP 3: INVENTORY NOTABLE FEATURES IN THE APE

This section provides an overview of the general trends associated with social, economic, natural, and historic resources within the study area, and identifies features that could be affected by indirect effects.

2.4.1 Socioeconomic Data and Trends

This section reviews socioeconomic conditions for the City of Reno, City of Sparks, and Washoe County, including:

- Population
- Employment
- Transportation to work
- Income and poverty
- Housing
- Schools

2.4.1.1 Population

Table 2-1 summarizes past (2000-2016) and projected future (2016-2036) population trends for the Cities of Reno and Sparks, as well as Washoe County. Overall the Cities of Reno and Sparks account for about 75 percent of the total population of Washoe County. Between 2000 and 2016 the City of Reno's population increased by 31.4 percent, the City of Sparks' population increased by 42.8 percent, and overall in Washoe County the population increased by 29.6 percent. The Washoe County Consensus Forecast anticipates an increase in population over the next 20 years in all areas, with the City of Reno's growth rate slightly greater than the City of Sparks' and Washoe County's growth rates (TMRPA 2016).[11]

Table 2-1. Regional Population (2000 – 2036)

Area	2000	2010	2016	2036	Change in Population (2000 – 2016) (%)	Increase in Population (2016-2036) (%)	Average Annual Growth (2016-2036) (%)
Reno	180,480	225,221	237,121	301,068	31.4	27.0	1.4
Sparks	66,346	90,264	94,718	116,629	42.8	23.1	1.2
Washoe County	339,486	421,407	439,914	548,159	29.6	24.6	1.2
Sources: U.S. Census Bureau 2000; U.S. Census Bureau 2010; U.S. Census Bureau 2017; Washoe County 2016.							

[11] The Washoe County Consensus Forecast, 2018-2038, illustrates the similar trends as identified in the 2016-2036 Consensus Forecast.

TMRPA population forecasts used in the regional travel demand model for the RTC's *2040 Long-Range Transportation Plan*[12] predict that population in Washoe County will grow by approximately 130,366 residents over the 25-year period, from 417,047 in 2015 to 547,413 in 2040.

Figure 2-4 illustrates existing population in 2015. For the most part, population is greatest in the traditional urban core. Areas with the least population tend to be at the periphery of the secondary APE, although this is not true in all cases. Figure 2-5 illustrates the change in population from 2015 to 2040 within the secondary APE. In general, the locations that are forecast to receive the most growth are near the boundaries of the TMSA and US 395 N. The Evans Ranch Planned Unit Development (5,697 units) and Silver Star Ranch Planned Unit Development (1,600 units), in North Valleys, have the greatest forecast growth.

2.4.1.2 Employment

This section provides an overview of past and projected employment trends for the Reno-Sparks Metropolitan Statistical Area (MSA),[13] Washoe County, and the State of Nevada, as well as an overview of major employers in the secondary APE.

Table 2-2 provides information on labor force characteristics. The unemployment rate in the Reno-Sparks MSA declined by 6.5 percent in the 5-year period from 2012 to 2017. The unemployment rate for the state was about the same as that of the county in 2012 and about 1 percent higher than the county in 2017 (Nevada Department of Employment, Training, and Rehabilitation 2018).

Table 2-2. Regional Employment Characteristics (2012, 2017)

Characteristic[a]	Reno-Sparks MSA		Washoe County		Nevada	
	2012	2017	2012	2017	2012	2017
Labor Force	223,780	240,512	221,874	238,545	1,375,637	1,474,324
Employed	200,912	231,525	199,222	229,653	1,233,000	1,405,209
Unemployed	22,868	8,987	22,652	8,892	142,637	69,115
Unemployment Rate (%)	10.2	3.7	10.2	3.7	10.4	4.7

[a] Not seasonally adjusted

Source: Nevada Department of Employment, Training, and Rehabilitation 2018.

[12] The regional travel demand model used in RTC's 2040 Long-Range Transportation Plan incorporated demographic data from the 2010 U.S. Census, 2015 American Community Survey, and 2016 Washoe Country Consensus Forecasts. Population and employment data was developed by the TMRPA using an allocation-based model to aggregate data by Traffic Analysis Zones (TAZs) from 2015 and 2040.

[13] Reno-Sparks MSA includes all of Washoe County and a portion of Storey County.

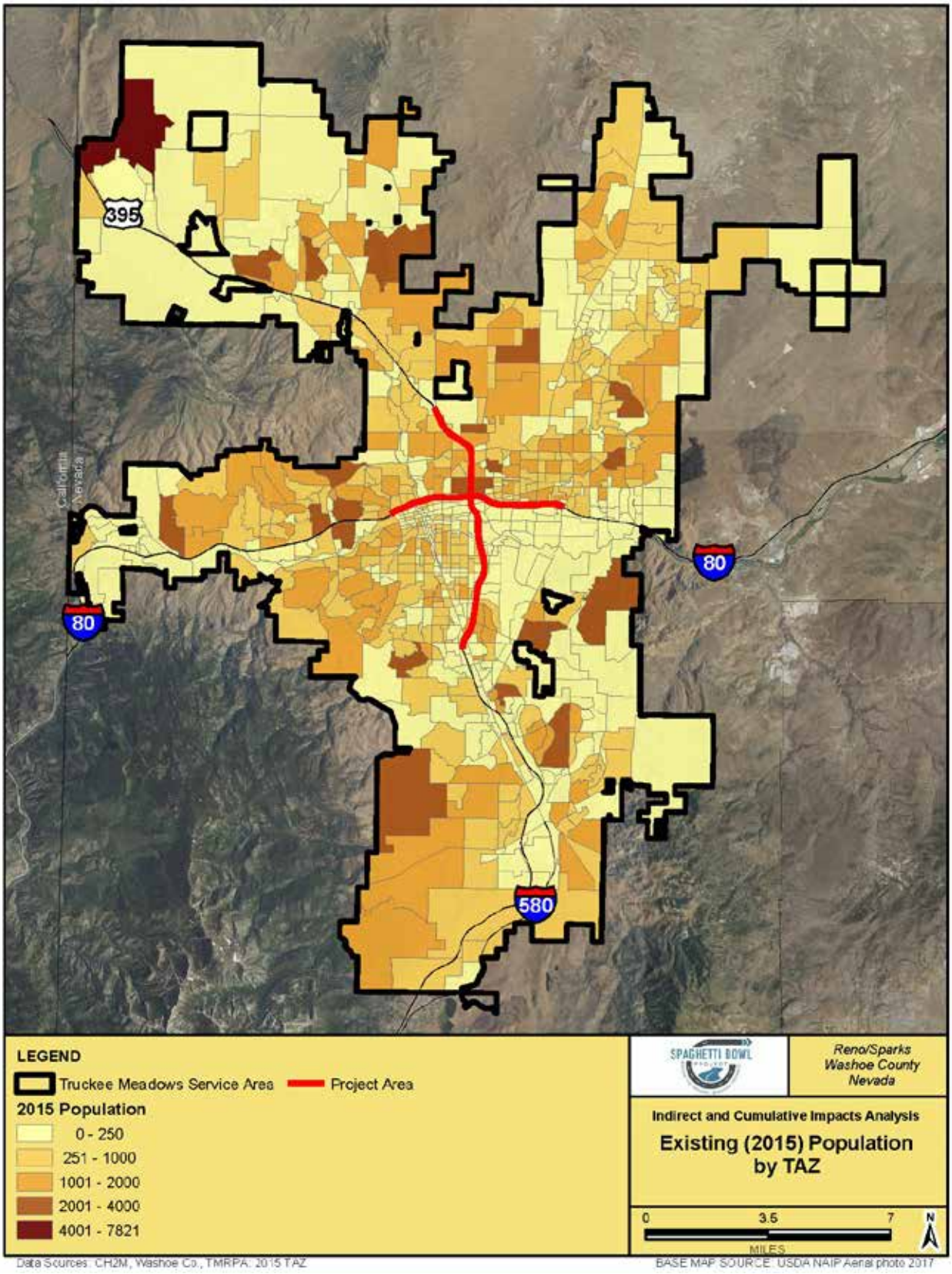


Figure 2-4. Existing Population

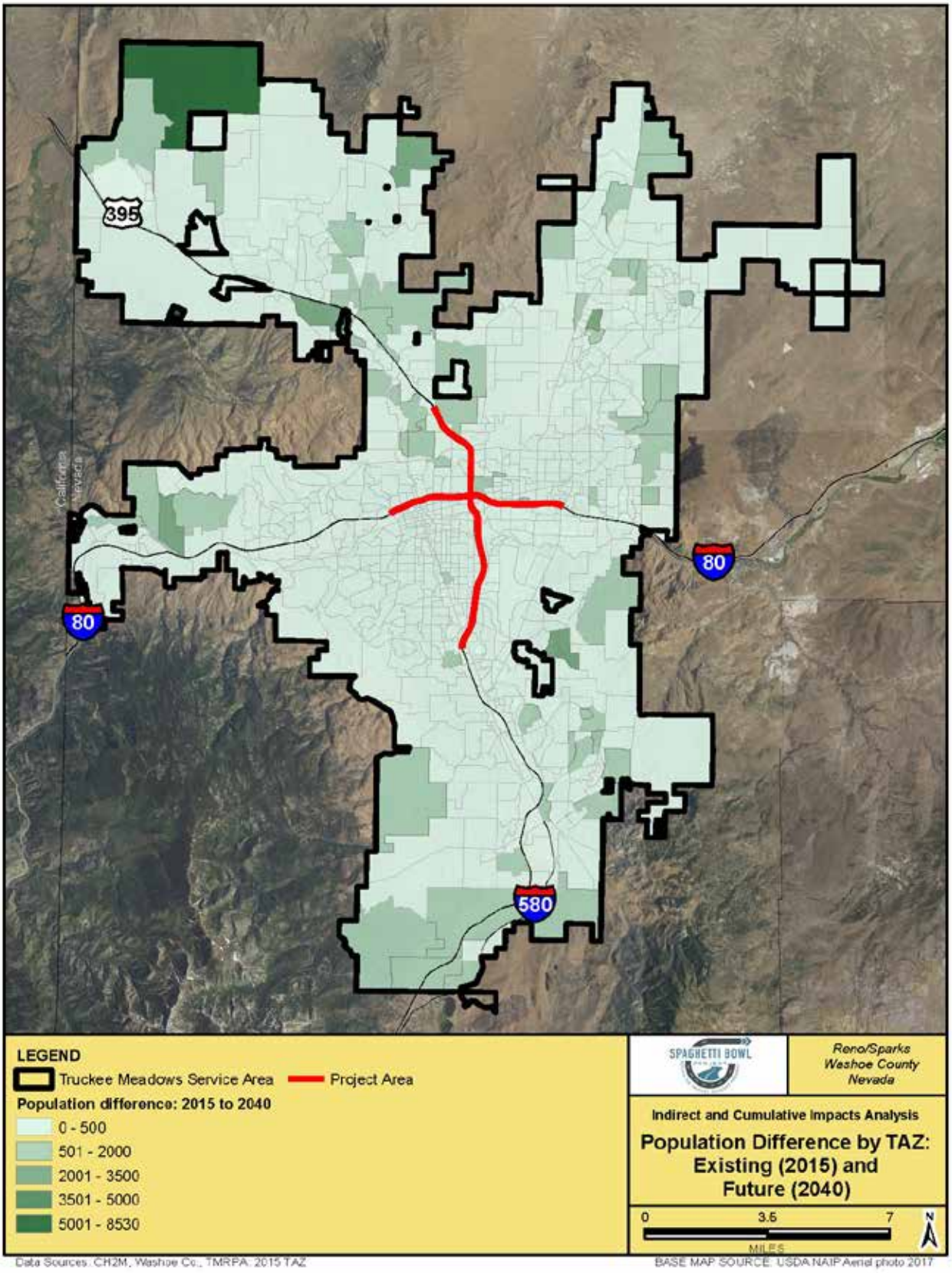


Figure 2-5. Population Difference (2015 to 2040)

The Washoe County Consensus Forecast (TMRPA 2016) provides current and forecasted employment (2016 – 2036) for Washoe County. Employment is projected to grow by approximately 75,000 jobs, from 272,484 in 2016 to 347,411 in 2036. This represents an average annual growth rate of 1.26 percent.[14]

TMRPA employment forecasts used in the regional travel demand model for RTC's 2040 Long-Range Transportation Plan predict that employment in Washoe County will grow by approximately 118,000 jobs over the 25-year period, from 267,029 in 2015 to 384,590 in 2040. This represents an average annual growth rate of 1.47 percent.

As Figure 2-6 shows, employment in 2015 was greatest in the traditional urban core and along I-80 and I-580/US 395. In particular, the Sparks Industrial Center south of I-80 is a major employment hub, northeast of the Reno-Sparks International Airport and south of the Reno-Stead Airport. Figure 2-7, which illustrates the change in employment between 2015 and 2040 across the secondary APE, shows that, in general, North Valleys (Reno-Stead Airport area), the area along US 395 N, and South Meadows are projected to experience the greatest job growth. In the North Valleys, the RTAA has plans for a 1,700-acre Reno-Stead Business Park that will house onsite expandable rail service and a regional jobs center, which could include aerospace data, advanced manufacturing, and logistics (O'Day 2016). During the expert panel interviews conducted in December 2017, staff from TMRPA identified the North Valleys as an emerging job area and indicated that there are currently 1,000 jobs in the area, with projections for up to 5,000 jobs by 2040 (see Attachment 2).

During the expert panel interview, staff from the RTC also identified the area along US 395 N between Stead Boulevard and Lemmon Drive as an employment growth area where there is ongoing industrial and warehouse development (e.g., Amazon Fulfillment Center, UPS). In addition, during the expert panel interview, staff from the TMRPA identified the Tahoe Reno Industrial Center (TRIC) as a major employment area. Although TRIC is outside of the study area in Storey County, it contributes to congestion on I-80 east of the metropolitan area. Currently, TRIC houses approximately 5,000 jobs, a number expected to grow to approximately 30,000 (see Attachment 2).

South Meadows, approximately 7 miles south of the Spaghetti Bowl and adjacent to I-580 to the east, is an existing employment hub in the Reno/Sparks area, and continued development is forecast through 2040. Ongoing development in the area includes a 120,000-square-foot (20-acre) retail development, named The LOOP, at the northeast corner of South Meadows

[14] The Washoe County Consensus Forecast and RTC of Washoe County Long-Range Transportation Plan provide numbers for total employment in all of Washoe County, whereas the Nevada Department of Employment, Training, and Rehabilitation provides information on the County resident labor force, which is the cause of discrepancy between the current numbers from the sources. Following publication of the Draft EIS, the 2018-2038 Washoe County Consensus Forecast was released. It illustrated a similar annual growth rate to 2016-2036 forecast.

Parkway and Double Diamond Parkway. This $30 million development, with dining, entertainment, and recreation, will lead to new jobs in the area.

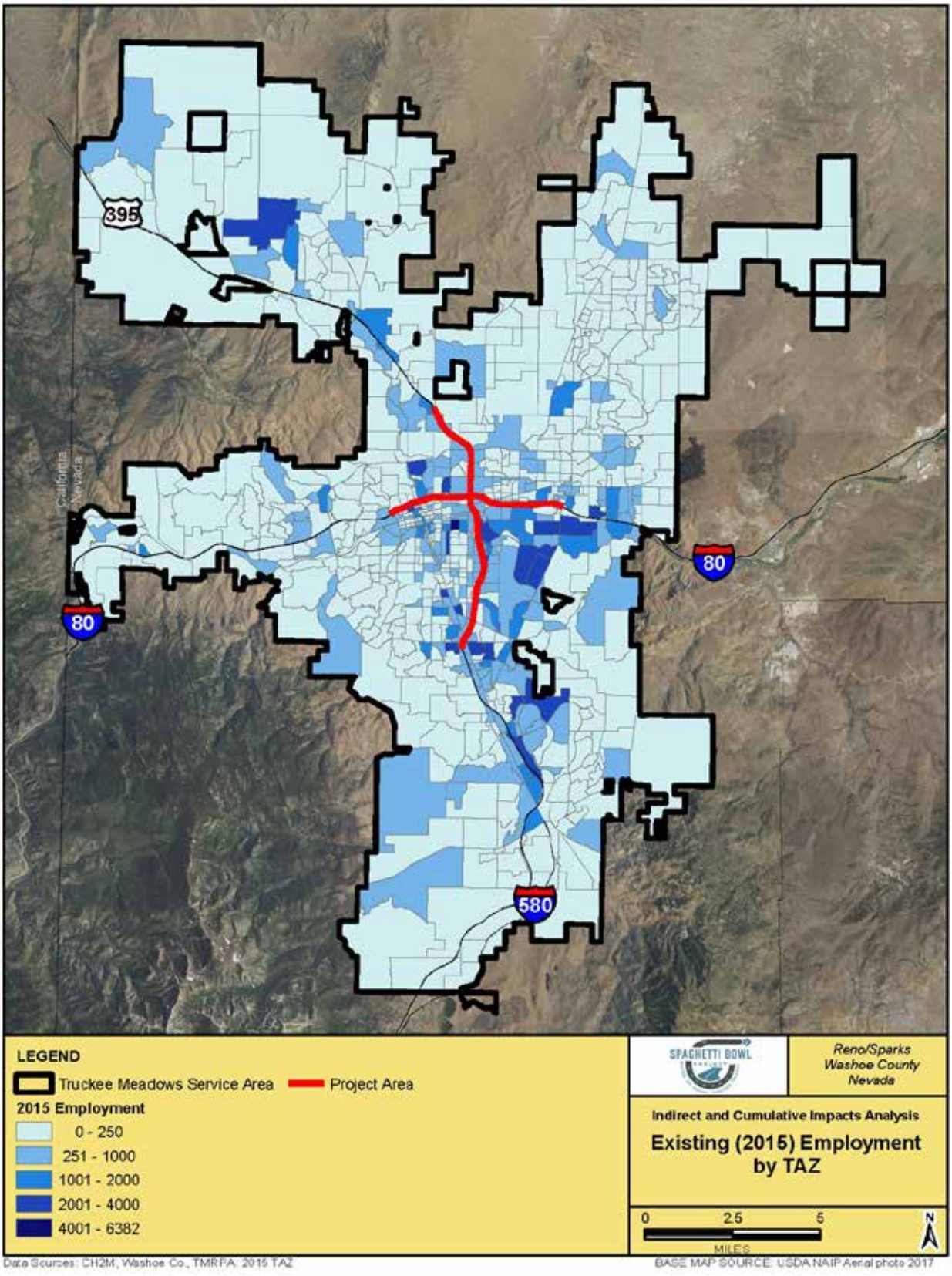


Figure 2-6. Existing Employment

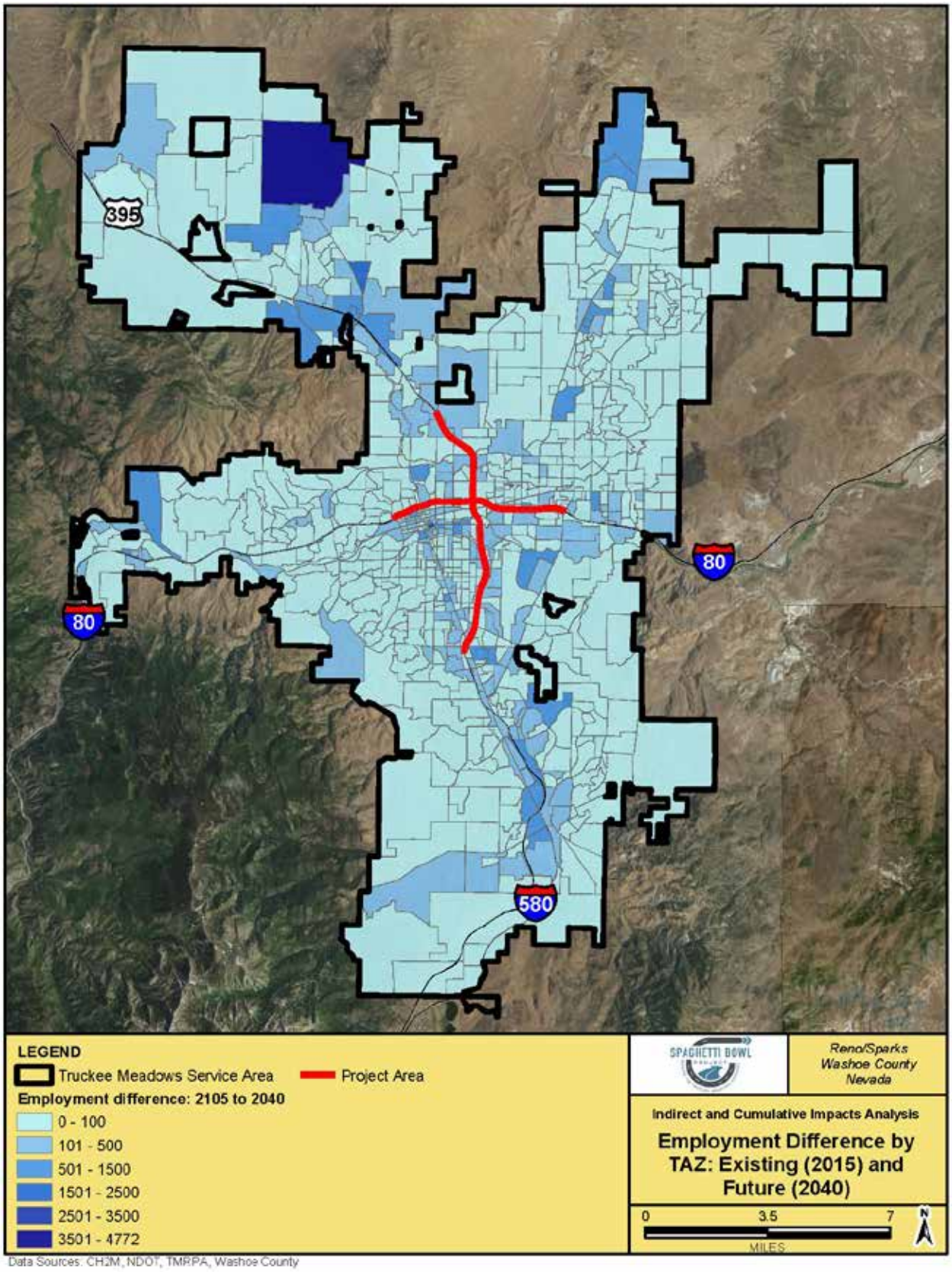


Figure 2-7. Employment Difference (2015 to 2040)

In addition, a new Renown Health operations building, housing the Contact Center, warehouse, information technology, and Revenue Cycle, will be on Oddie Boulevard in the old Lowe's building. Renown estimates that up to 500 employees will work at the building (Wong 2018).

Table 2-3 identifies the 20 largest employers in Washoe County in 2016. The Washoe County School District is the largest employer, with nearly double the number of employees as the second largest employer, University of Nevada, Reno. Seven of the top 20 employers are casinos. The Peppermill Hotel Casino, along the south leg of the project adjacent to Virginia Street, and the Grand Sierra Resort, southeast of the Spaghetti Bowl between Second Street and Mill Street, are the largest casino employers. In addition, several health service providers were in the top 20, including Renown Regional Medical Center, Saint Mary's Regional Medical Center, and Sierra Nevada Healthcare System.

Table 2-3. Top 20 Employers in Washoe County (2016)

Employer	Number of Employees
Washoe County School District	8,500 to 8,999
University of Nevada, Reno	4,500 to 4,999
Renown Regional Medical Center	3,000 to 3,499
Washoe County Comptroller	2,500 to 2,999
Peppermill Hotel Casino	2,000 to 2,499
Grand Sierra Resort	2,000 to 2,499
IGT	1,500 to 1,999
Atlantis Casino Resort	1,500 to 1,999
Silver Legacy Resort Casino	1,500 to 1,999
Saint Mary's Regional Medical Center	1,500 to 1,999
Sierra Nevada Healthcare System	1,000 to 1,499
City of Reno	1,000 to 1,499
Eldorado Hotel & Casino	1,000 to 1,499
United Parcel Service	1,000 to 1,499
Amazon	1,000 to 1,499
Nugget Casino Resort	1,000 to 1,499
Circus Reno	1,000 to 1,499
Truckee Meadows Community College	1,000 to 1,499
Integrity Staffing Solutions	700 to 799
City of Sparks	600 to 699
Source: Nevada Department of Employment, Training, and Rehabilitation 2016.	

2.4.1.3 Transportation to Work

Table 2-4 provides information on the means of transportation people use to get to and from work. Compared to the Cities of Reno and Sparks and Washoe County, the study area[15] has higher percentages of residents who carpool, use public transportation, or walk to work. The study area also has a higher percentage of households with no vehicle; households with no vehicles can be an indicator of low-income families. Within the study area, the number of households with no vehicle is about double that of Reno and Sparks.

Table 2-4. Means of Transportation to Work (Workers 16 Years and Over)

Area	Number of Workers	Drove Alone	Carpool	Public Trans-portation	Walked	Other Means	Work from Home	House-holds with No Vehicle
Study Area[a] (%)	24,404	16,347 (67.0%)	3,593 (14.7%)	1,068 (4.4%)	2,032 (8.3%)	963 (3.9%)	401 (1.6%)	4,012 (18.8%)
Reno (%)	115,080	87,868 (76.4%)	12,899 (11.2%)	3,062 (2.7%)	4,536 (3.9%)	2,671 (2.3%)	4,044 (3.5%)	9,583 (10.2%)
Sparks (%)	44,797	36,274 (81.0%)	5,052 (11.3%)	698 (1.6%)	741 (1.7%)	676 (1.5%)	1,356 (3.0%)	2,686 (7.5%)
Washoe County (%)	209,468	162,688 (77.7%)	23,371 (11.2%)	4,396 (2.1%)	5,994 (2.9%)	4,221 (2.0%)	8,798 (4.2%)	13,206 (7.9%)

[a] The study area for socioeconomic conditions is 0.25 mile from the existing freeway right-of-way, and is representative of the primary APE.

Source: U.S. Census Bureau 2017.

2.4.1.4 Income and Poverty

As shown in Table 2-5, the median household income in the study area is lower than the Cities of Reno and Sparks, and Washoe County. Furthermore, compared to the cities and Washoe County, the study area has a greater percentage of the population below the poverty level.

Table 2-5. Income and Poverty Characteristics (2017)

Characteristic	Study Area[a]	Reno	Sparks	Washoe County
Population	53,089	232,750	94,198	434,524
Median Household Income	$32,318	$48,815	$54,196	$54,955
Population Below Poverty (%)	16,428 (31%)	42,764 (18%)	11,565 (12%)	65,024 (15%)
Average Household Size	2.5	2.47	2.63	2.57

[a] The study area for socioeconomic conditions is 0.25 mile from the existing freeway right-of-way, and is representative of the primary APE.

Source: U.S. Census Bureau 2017.

[15] The study area for socioeconomic conditions is 0.25 mile from the existing freeway right-of-way, and is consistent with the Community Impacts Assessment Technical Report and the Environmental Justice Technical Report. This study area is representative of the primary APE.

NDOT and FHWA use the Department of Health and Human Services poverty guidelines, which are defined by a family's income and vary by family size.[16] Based on the 2018 Poverty Guidelines, a household of four is considered low-income at $25,100 annual income and an individual living alone at $12,140 (U.S. Department of Health and Human Services 2018).

2.4.1.5 Housing

As illustrated in Table 2-6, the total number of dwelling units increased in the Truckee Meadows Services Area from 126,396 in 2000, to 174,924 in 2015, an increase of 48,528 dwelling units or 38 percent.

Table 2-6. Total Dwelling Units, Truckee Meadows Services Area (2000 and 2015)

Area	Number of Units		Change (2000-2015)	
	2000	2015	Number	Percent
Unincorporated Washoe County	22,502	30,838	8,336	37%
Reno	77,156	104,999	27,843	36%
Sparks	26,738	39,087	12,349	46%
Total	**126,396**	**174,924**	**48,528**	**38%**
Source: TMRPA 2017.				

As shown in Table 2-7, which provides more information on existing housing characteristics, the City of Reno has a greater percentage of renter-occupied units, and both the City of Sparks and Washoe County have higher percentages of owner-occupied units. For renters, all areas have similar percentages of gross rent representing 30 percent or more of income, with all areas either near or just over 50 percent of renters paying 30 percent or more of their income on rent. According to the U.S. Department of Housing and Urban Development, families who pay more than 30 percent of their income for housing are considered cost burdened and may have difficulty affording necessities such as food, clothing, transportation, and medical care (U.S. Department of Housing and Urban Development undated). Cost burden among renters is of concern because renter households typically have lower income and can afford to spend less on housing.

[16] There are two slightly different versions of the federal poverty measure: poverty thresholds and poverty guidelines. The poverty thresholds are the original version of the federal poverty measure and are updated each year by the Census Bureau. The Census Bureau uses a set of money income thresholds that vary by family size and composition. The poverty guidelines are a simplification of the poverty thresholds.

Table 2-7. Housing Characteristics

Characteristic	Study Area[a]	Reno	Sparks	Washoe County
Total Households	21,314	93,769	35,769	169,015
Housing Units (Occupied)	21,314	93,769	35,905	169,015
Owner-Occupied (%)	5,751 (27%)	43,483 (46.4%)	20,396 (56.8%)	96,055 (56.8%)
Renter-Occupied (%)	15,563 (73%)	50,286 (53.6%)	15,509 (43.2%)	72,960 (43.2%)
Median Rent	$726	$872	$971	$918
Households with Gross Rent at 30% or more of Income	54%	50.4%	49.9%	49.3%
Total Housing Units[b]	**24,021**	**103,210**	**38,746**	**187,716**

Source: U.S. Census Bureau 2017.

[a] The study area for socioeconomic conditions is 0.25 mile from the existing freeway right-of-way, and is representative of the primary APE.

[b] Includes occupied and vacant housing units.

Figure 2-8 shows existing households in the secondary APE. In general, there are fewer households at the periphery of the secondary APE, and more households closer to downtown Reno and Sparks. Figure 2-9 shows the projected difference in households between 2015 and 2040. In general, the locations that are forecast to receive the most growth are near the boundaries of the TMSA and US 395 N. The Evans Ranch Planned Unit Development (5,697 units) and Silver Star Ranch Planned Unit Development (1,600 units), in North Valleys, have the greatest forecast growth.

The *Truckee Meadows Housing Study* (TMRPA 2017) estimates that by 2035, 50,636 new units will be needed in the TMSA to accommodate future growth in the region. Table 2-8 illustrates the allocation[17] of future dwelling units in the TMSA. The study's capacity analysis estimated that over 90,000 new dwelling units could be provided in the TMSA under current zoning designations through development of vacant residential land and lands with infill and redevelopment potential.

Table 2-8. Projected Dwelling Units in TMSA based on Jurisdictional Splits (2035)

Jurisdiction	Future Population	Future Units Needed Based on Population	Vacant Units[a]	Total Future Units Needed
Reno	74,691	28,727	3,160	31,888
Sparks	27,498	10,576	1,163	11,739
Unincorporated Washoe County	16,417	6,314	695	7,009
Totals	**118,606**	**45,618**	**5,018**	**50,636**

[17] TMRPA used a jurisdictional split methodology developed in the Washoe County Consensus Forecast to allocate future units to each jurisdiction's TMSA (TMRPA 2016). Following publication of the Draft EIS, the 2018-2038 Consensus Forecast was published. The trends illustrated in the 2018-2038 forecast are similar to the 2016-2036 forecast.

[a] The TMRPA assumed a vacancy rate of 11%.

Source: *Truckee Meadows Housing Study*, Exhibit C-6 (TMRPA 2017).

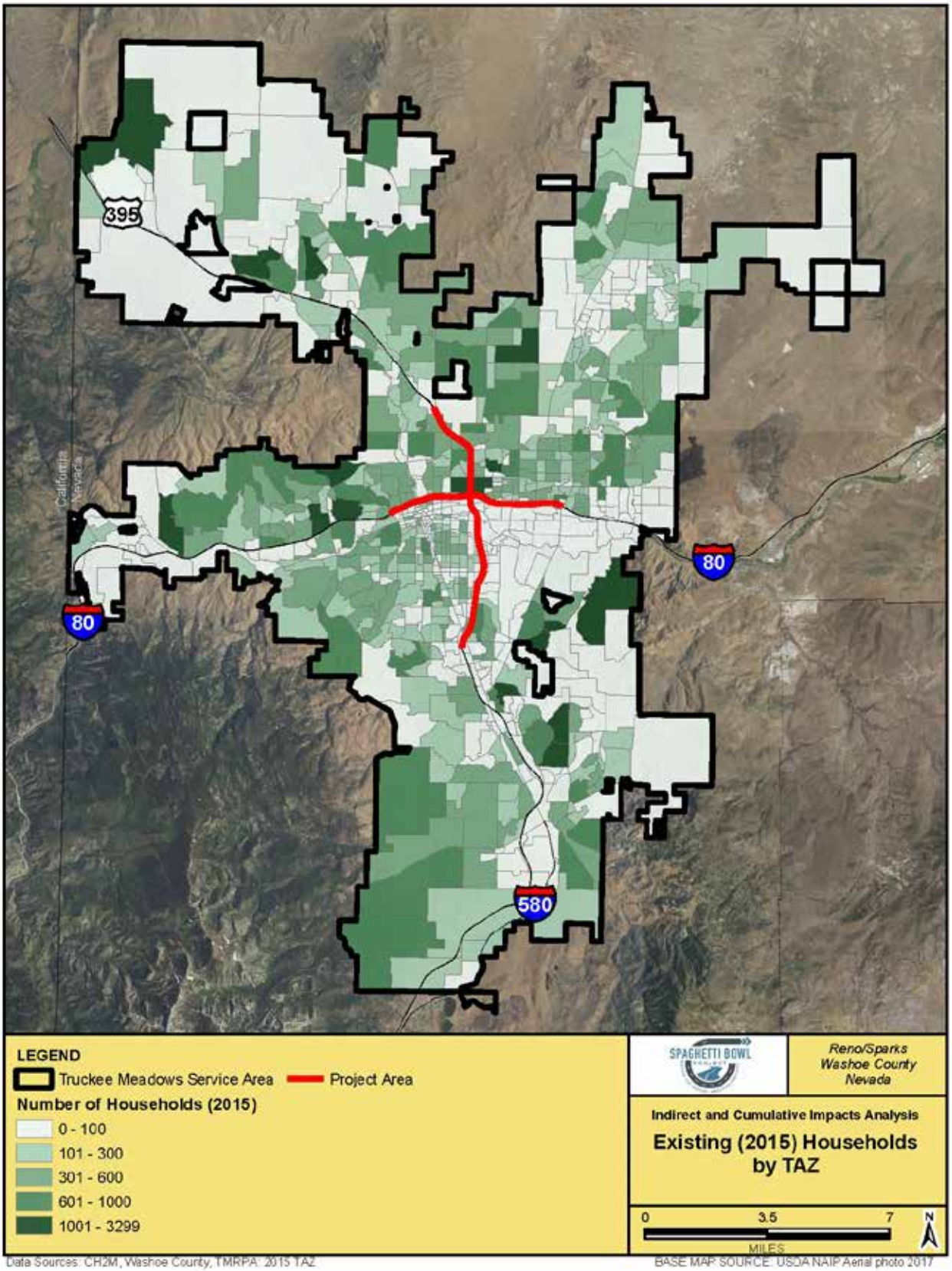


Figure 2-8. Existing Households

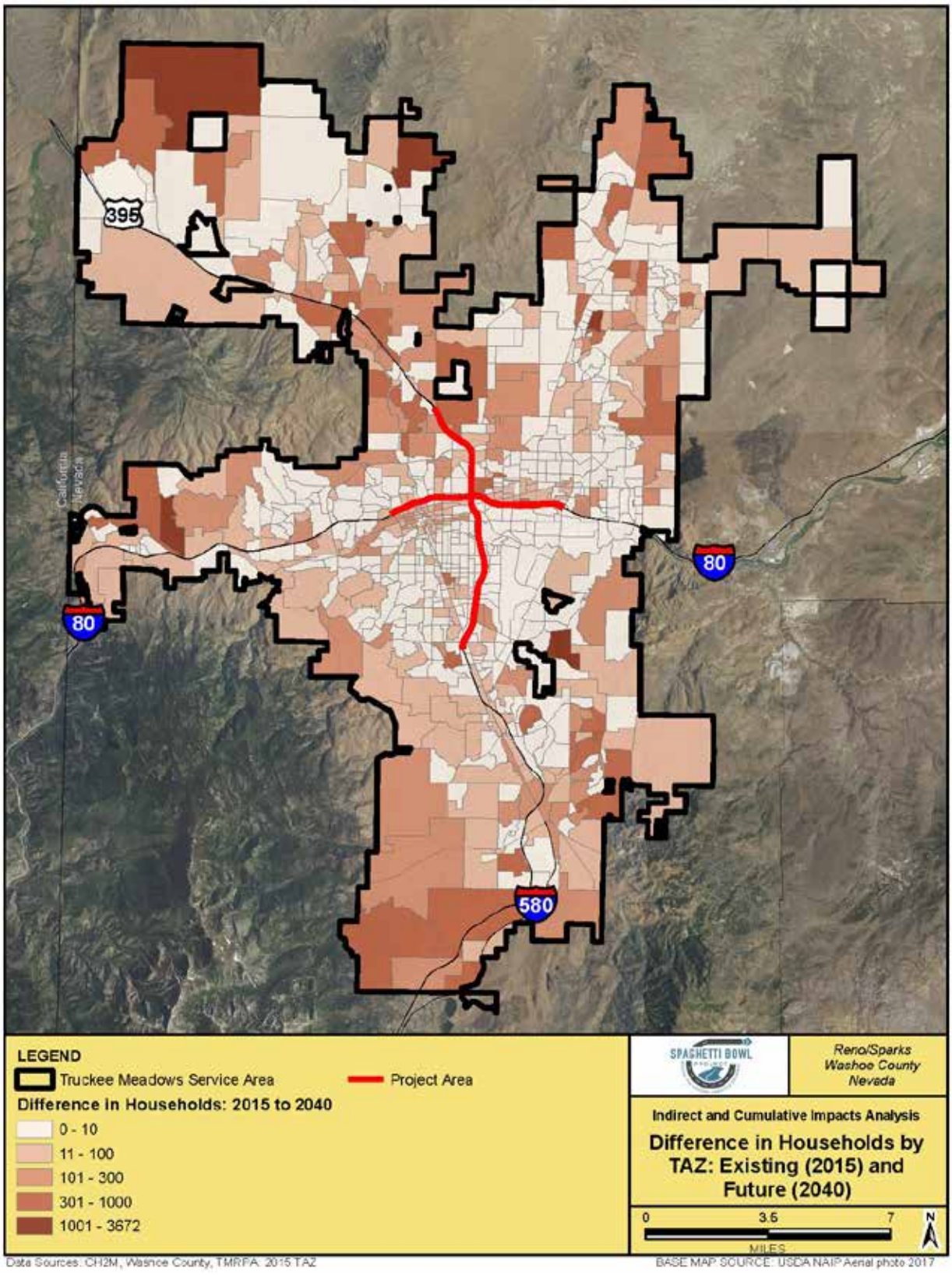


Figure 2-9. Households Difference (2015 to 2040)

Even though the capacity analysis demonstrated that enough land is available to accommodate forecasted growth, the *Truckee Meadows Housing Study* (TMRPA 2017) concluded that the region needs a wider variety of housing types to meet anticipated demographic shifts and affordable housing needs. Specifically, the region does not have enough housing that is affordable for moderate- and lower-income households. Over the last two decades, the costs of ownership of single-family detached housing in the Truckee Meadows has increased by more than 60 percent, while household incomes have increased by about 17 percent (TMRPA 2017).

In 2013, the median value of a house in Reno was 4.1 times the median household income, while in Sparks it was 3.4 times the median household income. In comparison, the median value of a house in the State of Nevada was 3.2 times the median household income.

Recent economic growth in the region has put additional pressure on the housing market, increasing rents and home prices (Enterprise Community Partners, Inc. 2017). This dynamic has led to an overall shortage of affordable housing, particularly for those households earning less than $25,000.[18] This issue is compounded by an insufficient supply of different types of housing to meet the diverse needs in the community, often referred to as the "missing middle" housing. "Missing middle" housing includes a variety of housing types to fill the gap between single-family detached units and mid-rise complexes, such as cottage housing, duplexes, townhouses, and apartments. Given the current development and growth trajectory, rents and home prices are expected to continue to escalate due to the housing shortage.

Local jurisdictions and the Truckee Meadows Regional Planning Agency are committed to developing affordable housing to meet the needs of lower-income residents. The Truckee Meadows Regional Plan (2013) established a goal that, "Within one year of the adoption of the Regional Plan local government master plans must include strategies based on quantifiable goals set by the jurisdiction to a) increase affordable housing opportunities for persons earning less than 80 percent of area median income and b) increase workforce housing opportunities for persons earning between 80 and 120% of the area median income. The goals will be measurable, with a timeline that covers at least the five-year planning period."

A section of the Washoe County Master Plan (2010) is devoted to housing and establishes goals and actionable policies/programs to improve and increase the availability affordable housing, including:

- Remove all regulatory barriers to increase the availability of affordable housing for all.
- Preserve and rehabilitate existing affordable housing.

[18] In Reno, about 29 percent of households earn less than $25,000 per year, and in Sparks about 21 percent earn less than $25,000 per year (TMRPA 2017).

- Provide developer incentives.
- Identify funding sources for affordable housing.
- Promote homeownership opportunities.
- Coordinate regional housing initiatives to pursue regional efficiencies in all matters related to affordable housing.

As part of its efforts to support affordable housing, the City of Reno is developing an ordinance that could allow for accessory dwelling units to be built within certain locations of the city (City of Reno 2017b). An accessory dwelling unit is a residential unit built on the same parcel as an existing single-family home. Accessory dwelling units provide an opportunity to diversify affordability in a neighborhood by allowing rental units for extended families or other members of the public. The City of Reno Master Plan (2017a) also includes several objectives related to affordable housing:

- Monitor and periodically update the Land Use Plan to ensure the City has an adequate supply of land designated for wide variety of housing types based on demand.
- Ensure that the Land Use Plan accommodates a mixture of housing types and sizes in all quadrants of the City, including attached and detached home types and at varying densities and price points.
- Develop a targeted housing strategy to facilitate and incentivize the creation of affordable housing units for low-income residents and attainable housing for the City's workforce (referred to as "workforce housing"). Update the strategy periodically to address changing needs.
- Encourage the development of affordable and workforce housing by providing incentives for projects that incorporate units affordable to income levels identified in the housing strategy (see Policy 4.1c in the City of Reno Master Plan).
- Support the preservation and rehabilitation of existing subsidized affordable and workforce housing units through use of incentives and grant funding.
- Promote developments and rehabilitation programs that expand housing options that are accessible to seniors and persons with disabilities, through the use of universal design and visibility principles.

- Work cooperatively with the City of Sparks, Washoe County, and other partners to pursue regional efficiency related to affordable housing:

  – Pursuing funding regionally at all levels
  – Publicizing and marketing affordable housing opportunities throughout the region, including rehabilitation and funding
  – Working to preserve viable affordable housing stock and to ensure long-term affordability for new units built with financial assistance

The City of Sparks Comprehensive Plan (2016) also includes policies to support affordable housing development:

- Promote a variety of housing types throughout Sparks, including within mixed-use settings, to expand the choices available to meet the financial and lifestyle needs of a diverse population and workforce.

- Use the Washoe County Home Consortium as a vehicle for the development and retention of rent- and income-restricted affordable housing.

- Create a housing plan that addresses the eight components in Nevada Revised Statute 278.160(8), including but not limited to maintaining and developing affordable housing to meet the needs of Sparks.

- Comply with Nevada Revised Statute 278.235 by implementing at least six of the 12 specified measures related to affordable housing.

Other local and regional planning agencies have participated in efforts to increase housing opportunities, such as the Truckee Meadows Affordable Housing Forum, to identify actionable steps to strengthen partnerships and increase the impact and production of affordable housing throughout the region. Action items pertaining to priority challenges are outlined in Attachment 5.

2.4.1.6 Schools

Schools in the Washoe County School District are overcrowded and have been for over a decade. Rapid population growth in the early to mid-2000s, along with a lack of funding, contributed to overcrowded schools (Sheehan 2016). Portable classrooms and scheduling electives outside school hours have been two temporary solutions to address overcrowding, but the sizes of cafeterias, lockers, and other areas like bathrooms remain unchanged. Flex schedules and year-round school are two extreme solutions that have been implemented (Beck 2016).

Table 2-9 identifies the schools in the Washoe County School District that are within or in proximity to the primary APE. In some instances, school boundaries intersect a small area of the

primary APE, but these schools do not draw a large student population from within the primary APE and are therefore not listed in Table 2-9.

Table 2-9. Washoe County Schools Within or in Proximity to the Primary APE

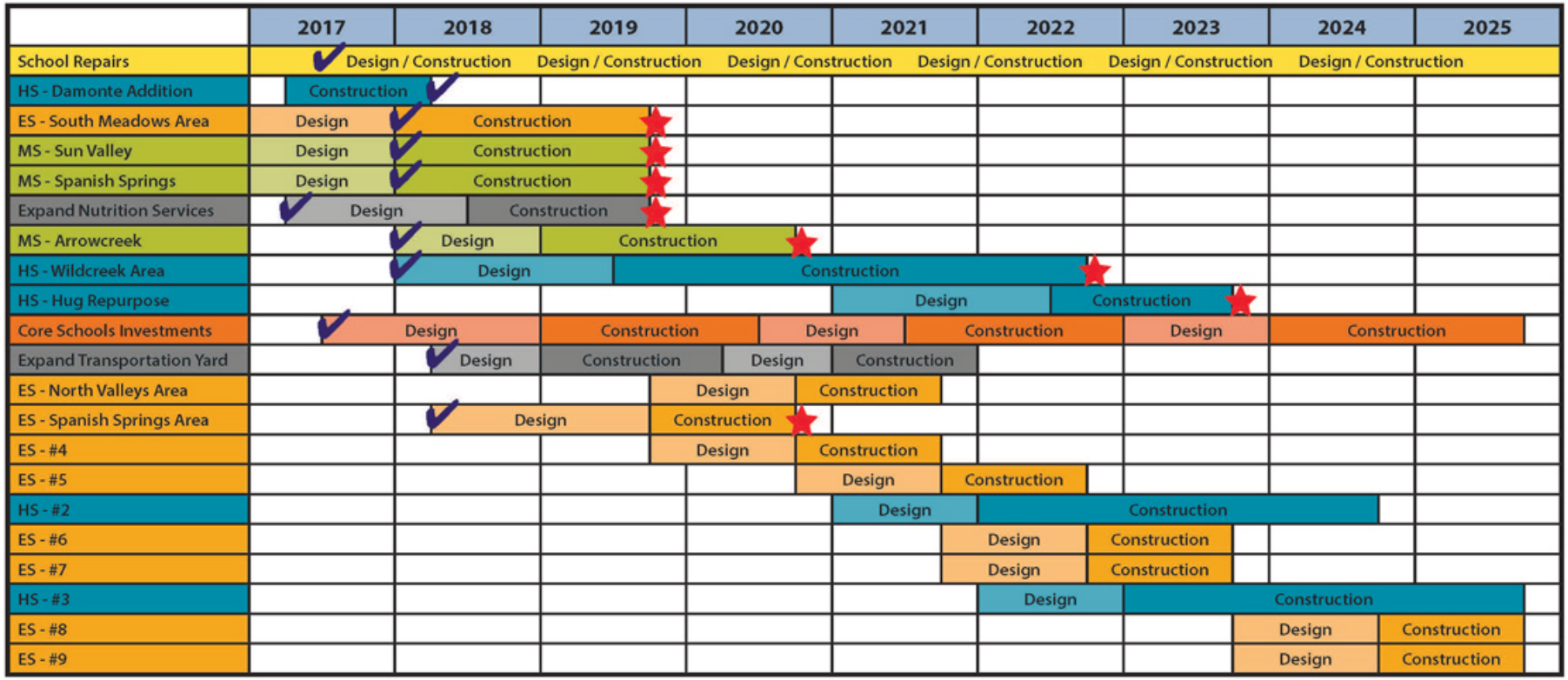
School Type	School Name	
Elementary Schools	Duncan Elementary	Smithridge Elementary
	Corbett Elementary	Lincoln Park Elementary
	Mitchell Elementary	Mathews Elementary
	Kate Smith Elementary	Cannan Elementary
Middle Schools	Fred W. Traner Middle School	Sparks Middle School
	Dilworth Middle School	Vaughn Middle School
	Pine Middle School	Clayton Middle School
High Schools	Reno High School	Sparks High School
	Hug High School	Wooster High School
Source: Washoe County School District 2018.		

In 2016, the school district had a backlog of $240 million in critical repairs to aging schools (Sheehan 2016). In the past, despite efforts to diversify revenue sources, the region was unable to fund needed investments, because only a small percentage of property tax goes to schools.

However, on November 8, 2016, voters in the Washoe County School District passed a bill (WC-1) to provide funding to repair and renovate older schools, build new schools to relieve current overcrowding, and have adequate classroom space to accommodate new students in the district. By 2025, the Washoe County School District plans to open three new high schools, three new middle schools, and nine new elementary schools, and to expand Damonte Ranch High School and repair and renovate older schools (Washoe County School District 2017). The schools within or in proximity to the primary APE that have been identified for major investments in the Infrastructure Plan include:

- Hug Repurpose (high school)
- Wildcreek Area (new high school)

Figure 2-10 shows the project timeline for each school. The locations for eight elementary schools and two high schools have yet to be determined.



KEY CONSIDERATIONS

1 Projects and timelines based entirely on WC-1 ballot measure
2 Project order and location subject to revision dictated by future enrollment growth
3 School Repairs projects (at least $20M/yr District-wide) prioritized by periodic evaluation of greatest need / worst condition
4 Core Schools Investments is an additional $50M investment in upgrades to older schools

★ ***Target opening date confirmed***

Figure 2-10. Washoe County School District Infrastructure Plan, Project Timeline

Source: Washoe County School District 2017.

The Washoe County School District provided substantial assistance in developing the *Truckee Meadows Housing Study* (TMRPA 2017). As part of the study, the school district translated the projections of housing units into projections of children by age and location for each year of the forecast period. The school district then identified the capacity of existing and planned future school facilities, and forecast when new schools of each type would be needed and at what price. Based on its involvement in the *Truckee Meadows Housing Study*, the school district is preparing for growth in the Truckee Meadows Region, and its Infrastructure Plan accounts for new students entering the district.

The school district is changing school zoning boundaries in several neighborhoods; these changes will go into effect during the 2019-2020 school year. The purpose of the change is to spread out children in certain areas to relieve overcrowding and growth. Children in their last year at one school can stay at that school in 2019 (Kitchen 2018).

2.4.2 Regional Land Use Patterns and Development Trends

This section describes the land use patterns and development trends for the primary and secondary APE, based on site visits and expert panel interviews conducted in December 2017, as well as a review of local land use plans (see Section 2.3).

2.4.2.1 Primary APE

The project is in a highly developed urban area. Residential and business land uses are throughout the primary APE, along with industrial and institutional land uses. The existing land uses in the primary APE are shown on Figure 2-11. In general, the north leg of the project (as shown on Figure 1-1) is mostly residential adjacent to the freeway, with commercial land uses along N McCarran Boulevard and institutional land uses at the north project limits, which include the Truckee Meadows Community College, Washoe County Sherriff, Washoe County Detention Facility, and Washoe County Juvenile Services.

The south leg of the project is in both commercial and residential land uses. Adjacent to I-580 is generally commercial land uses, with residential land uses beyond the commercial uses. The Reno-Sparks Indian Colony is both east and west of I-580 with commercial development on both sides of I-580 and residential development west of I-580. Wooster High School and Corbett Elementary School are on Plumb Lane and Villanova Drive, respectively, and Reno-Tahoe International Airport is on the east side of I-580. The west leg of the study area is mostly residential and commercial land use, including the University of Nevada, Community Services Agency, and Coral Academy Middle School on the north side of I-80, and downtown Reno on the south side of I-80. The Reno Housing Authority's Mineral Manor community is in the northwest quadrant of the Spaghetti Bowl. In addition, the Victorian Square redevelopment in downtown Sparks has recently led to the construction of luxury apartment buildings, including Fountainhouse and The Bridges, which removed much of the public parking north of I-80 and Victorian Avenue. Additional residential development is planned for Victorian Square.

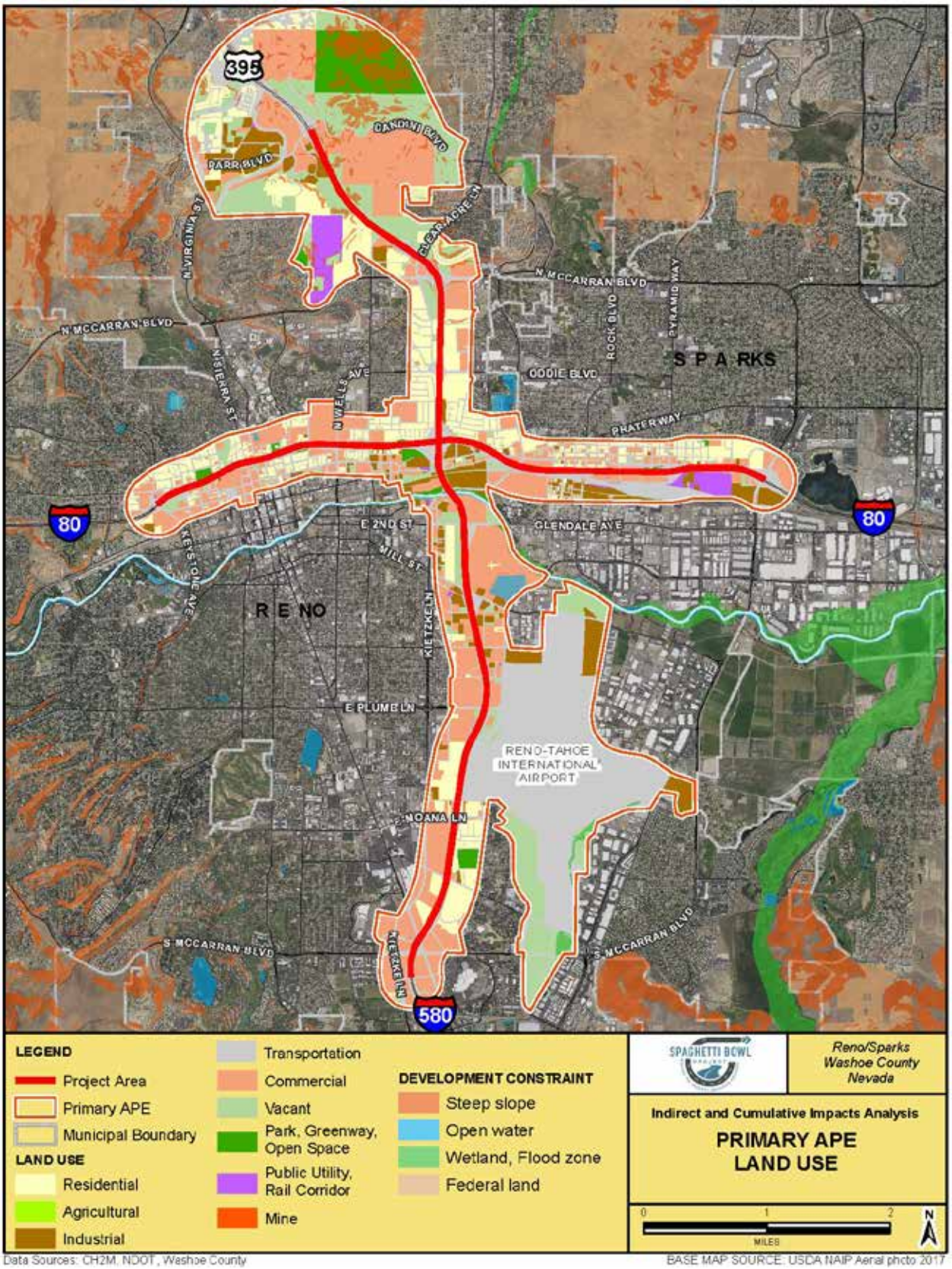


Figure 2-11. Primary APE Land Use

There are commercial and industrial land uses adjacent to the east leg of I-80 on the south side, including the Union Pacific Railroad yard and the Nugget Casino Resort, which is one of the largest employers in Washoe County. The north side of I-80 is commercial, residential, and mixed-use commercial-residential, including Victorian Square and downtown Sparks.

2.4.2.2 Secondary APE

The cities of Reno and Sparks are at the foot of the Sierra Nevada mountain range in a valley known as Truckee Meadows. The Truckee Meadows Water Authority, with a service area that closely resembles the secondary APE, has estimated that, between 1980 and 2009, approximately 96,000 acres were developed, about the same number of acres that had been developed since the time the first settlements appeared in the Reno/Sparks area in the mid-1800s (Truckee Meadows Water Authority 2009). The Truckee Meadows region is expected to continue to grow over the next 20 years (see Section 2.4.1, Socioeconomic Data and Trends).

Figure 2-12 shows existing land use in the secondary APE. Currently, 90 percent of residential land in the TMSA is for low-density and moderate-density single-family use. Multifamily units are primarily in downtown Reno and Sparks and along I-580, while low-density single-family houses are farthest from the traditional urban core. Commercial and industrial uses are primarily concentrated adjacent to the freeway. There is a heavy concentration of industrial land use in Sparks near the Sparks Industrial Center, south of I-80. Vacant developable land is primarily found at the periphery of the TMSA.

The Truckee Meadows region has growth management policies and land use controls that direct future growth. The TMSA serves as the boundary for the provision of municipal services and infrastructure and is used by the TMRPA to guide urban and suburban development (TMRPA 2013).

The region uses a development strategy called Planned Unit Developments (PUDs)[19] to direct development and control growth. PUDs are a type of zoning that allows greater flexibility of

uses on a site than a standard zoning ordinance to encourage an integrated package of development. For example, PUDs could include open space, schools, and commercial centers with residential development to provide for a mix of uses within a development. Local jurisdictions are responsible for approving PUDs. Within the secondary APE, there are 77 PUDs,

[19] PUDs are site-specific zoning designations, each with its own set of zoning regulations. Requesting a zoning change for a PUD is the initial step in the development process. The Tentative Map process is secondary and involves evaluation of available services prior to approval. The third step is final approval of the PUD.

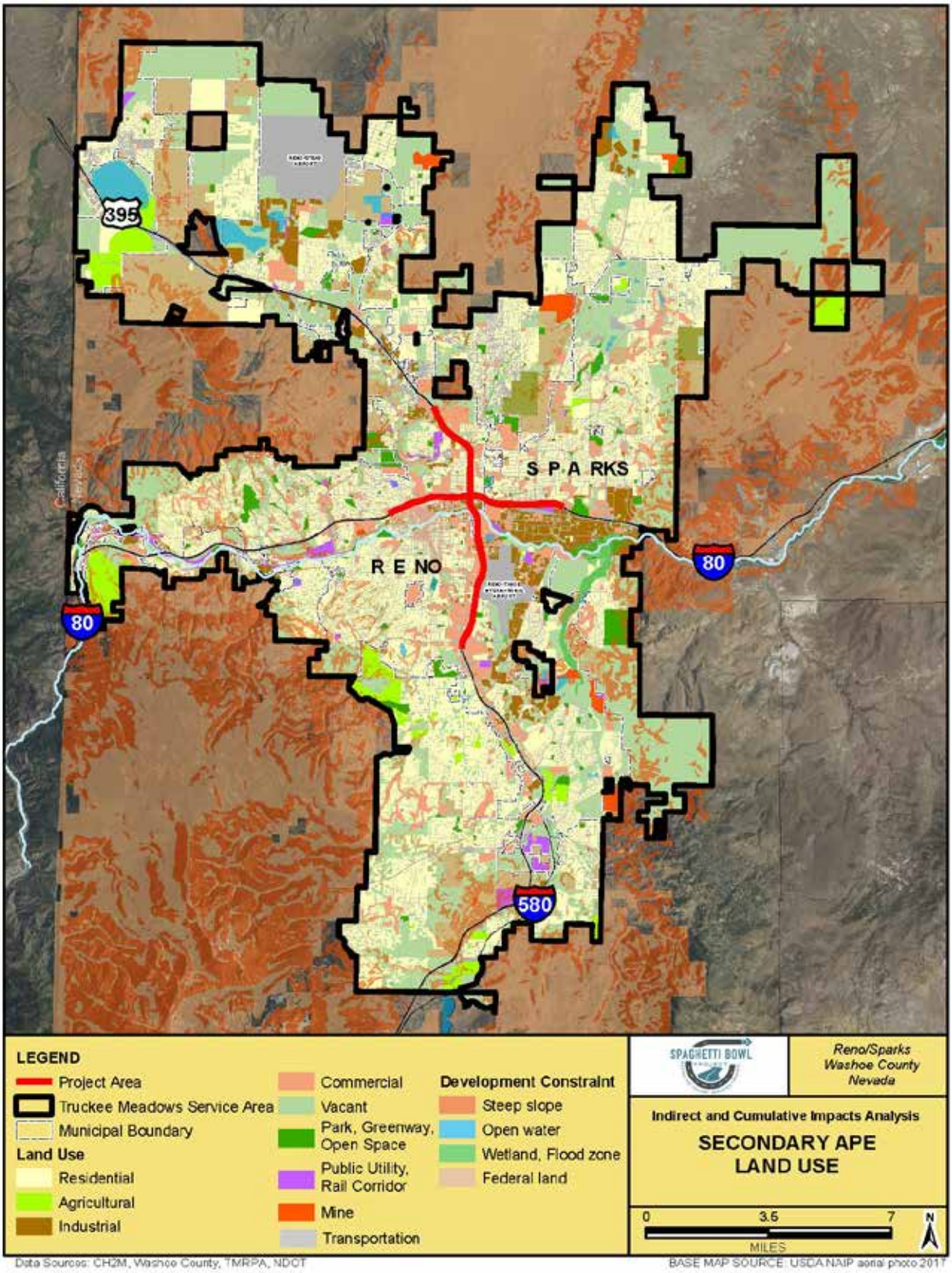


Figure 2-12. Secondary APE Land Use

which include approximately 78,000 housing units.[20] Additionally, there are 96 approved Tentative Maps (the second stage of PUD approval), including approximately 22,000 residential units. As illustrated in Figure 2-13, these developments are primarily clustered on the outskirts of the TMSA. Attachment 6 includes a table of the PUDs and Tentative Maps that correspond to the labels on Figure 2-13. TMRPA staff indicated that the region has more residential units planned (e.g., in PUDs) than will be needed within the 20-year horizon (see Attachment 3). The *Truckee Meadows Housing Study* identified the need for roughly 50,600 new housing units by 2035 (TMRPA 2017).

Furthermore, during the expert panel interviews, interviewees identified the capacity of the region's wastewater systems as a limiting factor to new development. The TMRPA will not approve Tentative Map requests if adequate water and sewer infrastructure are not available to support the proposed development. Sewer can be treated, but discharge after treatment is limited by absorption rates set by the State Engineer. Trucking the treated sewage has been discussed as an option, or a second wastewater treatment plant may be needed.

The Washoe County lands bill, if approved, has the potential to open some Bureau of Land Management and Forest Service lands within the TMSA to development. There are approximately 9,256 acres of Bureau of Land Management lands and 9,045 acres of Forest Service lands within the secondary APE, although not all of these lands have been identified for potential release to local jurisdictions in the proposed bill.

[20] The number of allowed units has not been designated for an additional 20 PUDs.

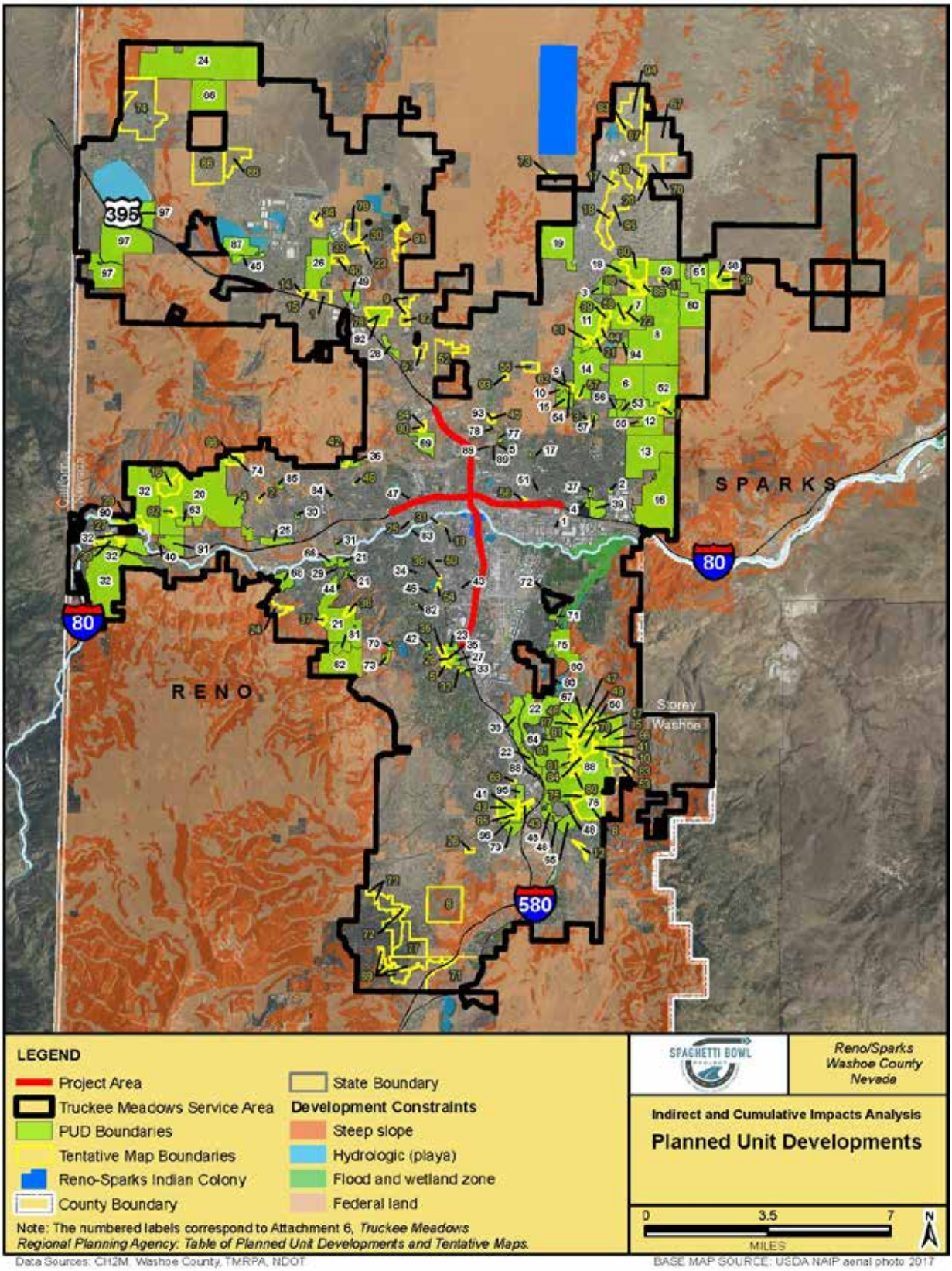


Figure 2-13. Planned Unit Developments

Expert panel interviewees identified the following major employment centers: Tahoe Reno Industrial Center (east of the TMSA), North Sparks/Spanish Springs, downtown Reno, South Meadows, Reno-Stead Airport (North Valleys), and warehousing/industry near the Reno-Tahoe International Airport. Reno and Sparks have several ongoing and planned redevelopment/revitalization projects. Expert panel interviewees identified the following key projects:

- **Fountain District Development:** A $500 million private redevelopment project to turn several blocks along W Fourth Street (Gold Dust West to the Sands Regency) in downtown Reno into a new arts and entertainment district (*Reno Gazette-Journal* 2017a).

- **West Second District:** A $1.2 billion investment in 17 acres between Washington Street and Arlington Avenue, and the Union Pacific Railroad and First Street. It proposes to turn the mostly empty land and motels into an earthquake-proof 40-story high-rise, hotels, condominiums, mixed-use apartments with retail, water reclamation plants, a central park, smart power systems, parking garages, and workforce and affordable mixed housing (Reno Gazette-Journal 2017b).

- **The LOOP:** A $30 million, 20-acre development in South Reno at the northeast corner of S Meadows Parkway and Double Diamond Parkway. The LOOP is a new multiuse complex set to open in 2018. The project includes a second location for the Reno Sportsdome, restaurants/bars, entertainment, and activities (e.g., roller skating, bowling lanes, arcade, ropes course) (Nelson 2017).

- **Park Lane Mall:** A $600 million, 45-acre mixed-use development on the former Park Lane Mall lot on Plumb Lane. The project calls for as many as 1,600 housing units and 85,000 square feet of retail and restaurant space, as well as room for a grocery store and a 1-acre park (Bennet 2017).

- **University of Nevada, Reno:** The campus plan identifies a Campus Gateway Precinct between Ninth and Eighth streets from N Virginia Street to Evans Avenue, within the University District. The project is part of a larger effort to revitalize the land between I-80 and downtown Reno.

- **Victorian Square:** A $35 million, mixed-use development in the historic Victorian Square in downtown Sparks. Throughout the next 5 to 7 years, it will add more than 1,500 housing units combined with 60,000 square feet of retail/commercial space, in addition to the renovation of the Galaxy Luxury 14-plex Theater and projects currently under construction (KTVN 2017). In January 2019, the Nugget Casino announced plans to build an 8,958-seat event center in Victorian Square (*Reno Gazette-Journal* 2019).

City of Reno staff indicated that the Fountain District Development and West Second District are in the conceptual stage. No entitlements have been conveyed by the City for these developments.

2.4.3 Natural and Historic Resources

This section describes the notable natural and historic resources in the primary APE that may be subject to indirect effects, based on site visits, resource studies and expert panel interviews conducted in December 2017.

2.4.3.1 Water Resources

Project biologists delineated 18.3 acres of natural watercourses such as the Truckee River and its tributaries, constructed irrigation/drainage canals, and one wetland within the study area (see Figure 2-14).[21] These natural watercourses and constructed canals are tributaries of the Truckee River. The Truckee River, which is the largest river in the study area, is the only Lake Tahoe outlet, and it empties into Pyramid Lake about 60 miles east of Reno and Sparks. The Truckee River, which provides habitat for two federal-protected fish species, the Lahontan cutthroat trout and the cui-ui, is also the primary drinking water source for the Truckee Meadows Water Authority, which serves more than 385,000 residents in the Reno and Sparks region.

The Truckee River in the study area is classified by Nevada and the U.S. Environmental Protection Agency as an impaired water. Impaired waters do not meet state water quality standards or for which designated uses[22] are not being achieved. The Truckee River is considered an impaired water because its water temperature regularly exceeds levels that are beneficial for native fish species and snails, worms, mollusks, and similar species that provide food for fish.

The Nevada Division of Environmental Protection's 2015 *Water Quality Trend Analyses for Selected Nevada Streams* indicates that pollutant concentrations in the Truckee River at the East McCarran Boulevard bridge are increasing for sulfate (sulfur-containing mineral salts), total dissolved solids (minerals, salts, and metals), and cloudiness in water caused by particles such as total dissolved solids.

[21] The water resources evaluation was limited to the 3,435-acre construction footprint.

[22] The Clean Water Act envisions that all waters be able to provide for designated uses that include recreation and the protection and propagation of aquatic life. Additional designated uses described in the Clean Water Act that can be adopted in standards by states and tribes include drinking water supply and fish consumption.

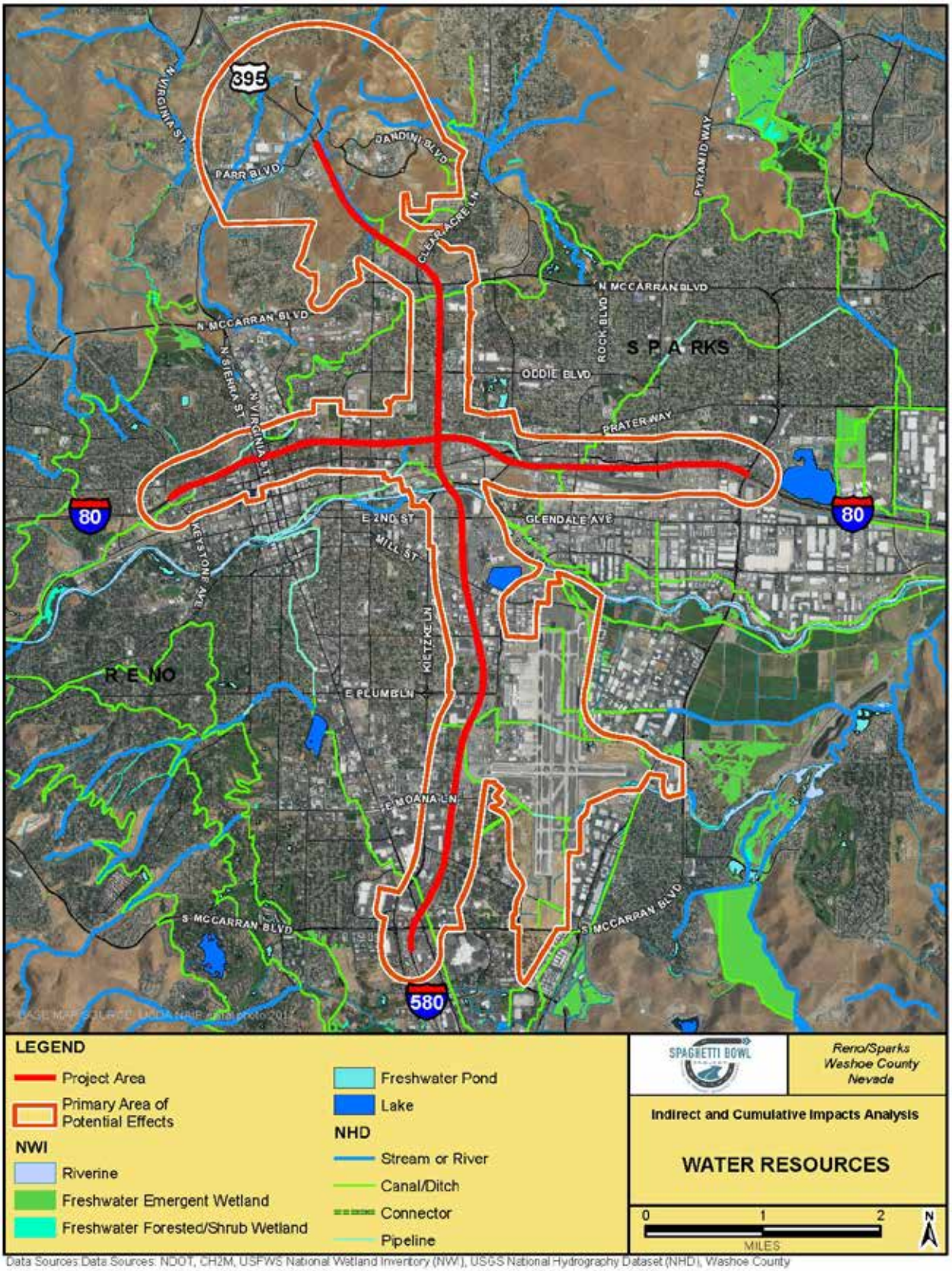


Figure 2-14. Water Resources

Currently, stormwater from the freeway system and local streets in the study area discharges to the Truckee River through storm sewers without engineered treatment such as detention ponds. The untreated stormwater that enters the Truckee River contributes to its water quality problems.

2.4.4 Reno-Sparks Indian Colony

2.4.4.1 Population

Based on the Reno-Sparks Indian Colony 2014 Demographics Survey, 326 tribal members live on Colony lands, and the entire population is American Indian (Reno-Sparks Indian Colony 2014).

2.4.4.2 Employment

Of the 233 Reno-Sparks Indian Colony members who were listed as 18 years old and over, 96 were employed including 74 full-time and 22 part-time, 91 members (39 percent) were unemployed, and 46 members were retired (Reno-Sparks Indian Colony 2014). Compared to the 2012 data presented in Table 2-2, the 2014 unemployment rate for the Reno-Sparks Indian Colony members is close to four times greater than the Reno-Sparks MSA rate.[23]

2.4.4.3 Income

Income data were collected at the household level as part of the Reno-Sparks Indian Colony 2014 Demographics Survey, and of the 166 households that provided information, 136 households (81.9 percent) are considered low-income. Within the Reno-Sparks Indian Colony, the median household income was $21,300, which is lower than Reno, Sparks, and Washoe County (Reno-Sparks Indian Colony 2014).

2.4.4.4 Housing

Within the Reno-Sparks Indian Colony, 98 (40.3 percent) of the housing units are owner-occupied and 134 (59.7 percent) are renter-occupied or nonowner/renter-occupied, which is defined as living with extended family (Reno-Sparks Indian Colony 2014). The percentage of owner- and renter-occupied units in the Reno-Sparks Indian Colony is similar to the City of Reno. Given that Reno-Sparks Indian Colony lands are largely built out, future residential development will likely occur in Hungry Valley.

2.4.4.5 Land Use Patterns and Development Trends

Primary APE. The Reno-Sparks Indian Colony owns 69 acres east and west of I-580, south of the Spaghetti Bowl (Figure 2-15). The land uses include a mixture of residential and commercial development, with a Walmart Supercenter east of the freeway and smoke shops to the west.

[23] No newer information is available to determine if the unemployment rate has dropped as it has in other areas.

Figure 2-15. Reno-Sparks Indian Colony Property

In addition, the Reno-Sparks Indian Colony Tribal Headquarters, Reno-Sparks Indian Archives, Reno-Sparks Indian Colony Senior Center, and the Reno-Sparks Indian Colony Recreation Center are within the boundaries of the Reno-Sparks Indian Colony. The Reno-Sparks Indian Colony's residential parcels may be subject to redevelopment with new types of housing in the future, although there is very little land could that could be used for new homes.

Secondary APE. The Reno-Sparks Indian Colony also has land holdings in Hungry Valley (outside the secondary APE), Spanish Springs, South Reno, and Verdi. There is residential land on portions of Hungry Valley, including a gym, community center, and Head Start Program for children. Most of the 15,623-acre parcel will be dedicated to passive recreation, because steep slopes, flooding drainages, and rocky or expansive clay soils constrain development (Reno-Sparks Indian Colony undated). The Reno-Sparks Indian Colony owns an additional 282 acres of land in Verdi, South Reno, and Spanish Springs, which are either partially or wholly committed to economic development (Reno-Sparks Indian Colony 1998). The Colony's holdings in Verdi

consist of a smoke shop along 3rd Street. In South Reno, along S Virginia Street, the Colony owns land and leases it to several auto dealerships: Mercedes-Benz, Acura, Infinity, and CarMax (Roberts 2017). These businesses provide substantial revenues for the operation of the Colony.

2.5 STEP 4: IDENTIFICATION OF IMPACT-CAUSING ACTIVITIES

Step 4 of the analysis examines the No Build Alternative and Alternatives 1, 2, and 3, and it identifies potential impact-causing activities that may be associated with the project, including construction, operation, and maintenance relevant to indirect effects. Impact-causing activities have the potential to be substantial and could affect resources in the APE.

2.5.1 No Build Alternative

The impact-causing activities of the No Build Alternative relate to its lack of action. It does not address the purpose of and need for the project to address existing highway deficiencies, safety concerns, bridge structure condition, and system connectivity. Under the No Build Alternative, bottlenecks and vehicle crashes would continue to increase, resulting in greater travel times and less reliable travel throughout the corridor. The condition of the freeway bridges would continue to deteriorate, requiring more frequent and extensive maintenance. Additionally, more commuter traffic would shift to local streets to avoid the congested freeway, which could diminish the neighborhood and business environments along several streets in the primary APE by increasing pedestrian-vehicle conflicts.

The No Build Alternative also does not provide the opportunity to treat stormwater runoff before it enters the Truckee River because there is currently no engineered treatment (e.g., detention ponds) to capture runoff. The Glendale Water Treatment Facility diverts water from the Truckee River. Under the No Build Alternative, freeway runoff is not treated before discharging to the river; therefore, it may contribute to incrementally higher facility treatment costs for the Glendale Water Treatment Facility. The lack of engineered treatment to capture runoff indirectly affects water quality in the Truckee River.

2.5.2 Alternatives 1, 2, and 3

The impact-causing activities of the project include modifying existing interchange access points, encroachment of freeway infrastructure on adjacent resources, and induced growth effects.

The changes in travel patterns from modifying existing interchange access points have been assessed as direct impacts and discussed in the *Spaghetti Bowl Project Community Impacts Assessment Technical Report* (Appendix D.2 of the Final EIS).

Encroachment of the reconstructed freeway could indirectly affect community resources (i.e., public schools), regional land use patterns, environmental justice, water resources, and the Reno-Sparks Indian Colony. Section 2.6 discusses potentially substantial indirect effects.

Induced growth effects, including the location or magnitude of future development that result from changes in accessibility caused by the project, could indirectly influence development (impacts causing a change in land use) on the human and natural environment. Section 2.5.2.1 assesses the potential for growth-related indirect effects and concludes that the Spaghetti Bowl reconstruction would not induce growth.

2.5.2.1 Induced Growth

Key underlying issues considered for the induced growth analysis include:

- The project does not have an explicit economic development purpose.
- The project would provide additional capacity at some locations, such as at ramps, to address bottlenecks, lane balance, and safety issues, but it would not involve freeway widening to provide additional travel lanes through the entire study area.
- The project would not increase future traffic volumes or induce traffic growth as compared to the No Build Alternative (i.e., there is no substantial difference in 2040 traffic volumes with or without the project).
- The project would improve mobility in the study area (e.g., eliminating a bottleneck at the northbound I-580 to eastbound I-80 ramp, which spills over and affects freeway travel speeds on I-580/US 395, so the project would improve forecast travel time by 10 minutes in the afternoon peak northbound direction).
- The region's strong land use controls will direct new development in the study area and the larger region to locations consistent with local and regional plans.
- The Truckee Meadows region is experiencing population and employment growth.

There is a very strong potential for land use change if the change in travel time for a project is more than 10 minutes (NCHRP Transportation Research Board 2007). NDOT's traffic analysis using the 2040 travel demand model indicated that under Alternatives 1, 2, and 3 there would be a travel-time saving of 10 minutes from the south project limit to the north end of US 395 (Meadowood Mall Way to Parr Avenue/Dandini Boulevard) in the afternoon rush hour. However, the travel-time saving is not a result of major capacity improvements but rather from operational improvements and removing bottlenecks. Although travel times are forecast to improve for other directions in the AM and PM peak periods, travel time savings would be less than 10 minutes and are unlikely to contribute to land use changes. In May 2017, NDOT conducted a sensitivity analysis to determine if the project would induce traffic growth compared 2040 traffic across the network with and without the project. It concluded that 2040 traffic volumes on all freeway links are similar (within 10 percent) with and without the project

(see Attachment 4, Exhibit 4-2), and therefore, Alternatives 1, 2, and 3 would not induce future traffic growth.

During the expert panel interviews in December 2017, staff from the TMRPA and RTC both commented that there is little correlation between future development in the project area and the Spaghetti Bowl Project (see Attachment 2). TMRPA staff commented that most PUDs have been in planning for decades and were put on hold during the recent recession. The University of Nevada, Reno staff commented that the project has the potential to expand residential development in North Valleys and Spanish Springs. The analysis of induced growth effects determined that the project is unlikely to cause residential development in locations where it is not directed by local and regional planning agencies due to local and regional land use policies. The project is responding to, not driving, existing and planned development in and adjacent to the primary and secondary APE.

During the expert panel interview, TMRPA stated that development in the region does not often depart from master plans because TMRPA signs off on projects of regional significance. Staff from both Reno and Sparks provided similar input, noting that development must conform with the cities' master plans to be approved. They also stated that it is difficult to depart from the master plans because infrastructure has been sized according to the plans. Furthermore, as noted in Section 2.4.2.2, the region has more residential units planned within existing PUDs than will be needed within the 20-year horizon, to 2036 (see Attachment 3), indicating that factors other than the project drive growth, such as new employment in the region.

The Reno City Council has tied the implementation of the StoneGate Development in Cold Springs to the implementation of the Spaghetti Bowl Project (City of Reno 2018). StoneGate is a 4,135-unit master-planned community, expected to be implemented in phases over 20 years. StoneGate concurrency requirements[24] establish that, "Upon the submittal of the first tentative map application…the applicant must demonstrate that a Notice to Proceed has been issued by NDOT for a construction contract on the first phase of the I-80/I-580 interchange project (i.e., Spaghetti Bowl)." Although the City has tied the tentative map application to Phase 1 Notice to Proceed, the StoneGate development is not dependent on improvements that would be provided by the Spaghetti Bowl Project, considering that the project would not provide substantial capacity improvements along the I-80/I-580 corridors. The Spaghetti Bowl Project, therefore, would not be responsible for encouraging or hastening growth that would occur as part of the StoneGate development. Development would occur as a result of City approval, which could occur without project improvements at the discretion of the Reno City Council, even though it has tied approval to Spaghetti Bowl construction.

[24] The principle of a concurrency requirement is that development will not proceed until specific infrastructure services are in place.

In consideration of expert panel input, the nature of the Spaghetti Bowl Project, and strong regional and local land use growth management strategies, the proposed project would not substantially change the location or magnitude of future development within the study area and beyond. Therefore, an induced growth indirect impacts analysis is not required.

2.6 STEP 5: ASSESS POTENTIALLY SUBSTANTIAL INDIRECT EFFECTS

This section examines potentially substantial indirect effects to community resources (i.e., public schools), regional land use patterns, environmental justice, water resources, and the Reno-Sparks Indian Colony. The indirect effects analysis examines encroachment-alteration effects[25] because the project would not have an induced-growth impact (see Section 2.5.2.1). Table 2-10 identifies the resources considered but not analyzed for potential indirect effects and the rationale.

Table 2-10. Resources Considered but Not Analyzed for Indirect Effects

Resource	Would This Resource Be Directly Affected? [a]	Would This Resource Experience Encroachment-Alteration Impacts? [b]
Noise	Yes, NDOT will mitigate traffic noise levels that exceed FHWA's noise abatement criteria where feasible.	There is no significant change between the 2040 No-Build and Alternatives 1, 2, and 3 traffic volumes. As such, encroachment-alteration effects are not expected to occur.
Air Quality	No	The project is not anticipated to violate National Ambient Air Quality Standards, and mobile source air toxics emissions are expected to be lower under the Alternatives 1, 2, or 3. As a result, there would no indirect air quality impacts.
Visual Character/ Aesthetics	No significant impacts are anticipated. NDOT would provide aesthetic treatments to the project's traffic noise barriers and structures in accordance with its statewide Landscape and Aesthetics Plan.	The project would reconstruct an existing freeway. While views of and from the road would change with the proposed improvements, no sensitive views are anticipated to be affected. Overall the urban visual character of the corridor is not expected to be substantially changed.
Community Impacts (residential, business)	Yes, NDOT would provide property owners whose property is acquired by the project with mitigation. NDOT would also consider mitigation measures for business/community	No residential encroachment-alteration effects are expected to occur, either within or outside of the construction footprint. No business encroachment-alternation effects are expected to occur, either within or

[25] Encroachment-alteration effects are the alteration of the behavior and functioning of the affected environment caused by project encroachment (physical, biological, socioeconomic) on the environment. These effects are caused by the proposed action but occur later in time or farther removed in distance.

Resource	Would This Resource Be Directly Affected? [a]	Would This Resource Experience Encroachment-Alteration Impacts? [b]
	facility owners if the project changes or eliminates their access to and from the freeway.	outside of the construction footprint; no businesses were identified by local planners that would result in the loss in economic viability of remaining businesses, business centers or districts.
Children's Environmental Health	No significant effects are anticipated.	No encroachment-alteration effects are expected to occur.
Transportation Service	Yes. Mitigation would address direct impacts.	The project would not have an encroachment-alteration effect on bicycle/pedestrian, transit, rail, or airports. The proposed improvements may change some paths or routes, but comparable service would be maintained.
Vegetation, Wildlife, and Fish	No.	No. Encroachment-alteration effects are not expected to occur. The project involves improvements to an existing freeway and is not adding major capacity; it is not expected to infringe on vegetation or wildlife/fish habitats.
Hazardous Materials	Yes, mitigation would address direct impacts.	No encroachment-alteration effects are expected to occur.
Cultural Resources	Yes. Appropriate mitigation measures to address the adverse effects to historic properties would be established through Section 106 consultation, which is ongoing, between the lead federal agency and consulting parties.	No encroachment-alteration effects are expected to occur. See *Section 106 of the National Historic Preservation Act Assessment of Effects Report* for more information.

[a] CEQ regulations state that direct effects are "caused by the action and occur at the same time and place" (40 CFR 1508.8). One example is a residential displacement.

[b] These are effects caused by the proposed action but that occur later in time or farther removed in distance. One example of an encroachment effect is a long-term decline in the viability of a population of a particular species as a result of habitat fragmentation caused by a project.

2.6.1 Community Impacts

This section discusses potential encroachment alteration effects on public schools in the primary APE.

2.6.1.1 Public Schools

Relocating families with school-aged children could have an indirect effect on public schools that are at capacity, because an influx of students that is not part of student growth anticipated by the schools could exacerbate overcrowding and lead to the need for portable classrooms, scheduling electives outside school hours, which could affect shift workers, and year-round

school. However, as discussed in Section 2.4.1.6, the Washoe County School District is in the midst of a construction program to repair and renovate older schools, build new schools to relieve current overcrowding, and provide adequate classroom space to accommodate new students in the district.

The Spaghetti Bowl Project would be implemented in five phases over a 20-year period; therefore, not all families with school-aged children would be relocated at the same time. The project would not cause new students to enter the school district. Although it is not known where families with school-aged children would be relocated or whether the relocations would require students to change schools, with completion of the Washoe County School District's expansion plans described in Section 2.4.1.6, three new high schools, three new middle schools, and nine new elementary schools are planned to be constructed by 2025 (Washoe County School District 2017).

Based on conceptual phasing plans for the Spaghetti Bowl, it is possible that between 12 (Alternative 2) and 236 households (Alternative 1) along I-80 east of Kietzke Lane would be displaced and relocated prior to all the Washoe County School District investments being complete. Mitchell Elementary School, Dilworth Middle School, and Sparks High School currently serve the area. Repairs, renovations, and upgrades to these schools are scheduled to be complete prior to residential relocations. To relieve current overcrowding, several new schools and school additions will be complete by this time, including an addition to Damonte Ranch High School (south Reno), a new Wildcreek area high school (near Clear Acre Lane), and repurposing of Procter Hug High School (McCarran Boulevard and Sutro Street). Furthermore, one new elementary school (South Meadows area) and three new middle schools are scheduled to be complete (southwest and northeast of Sparks). The project is not adding new students to the district, so the school district should be able to accommodate students who are required to change schools without indirectly contributing to overcrowding in Washoe County public schools.

Additionally, Alternatives 1 and 2 would have a direct effect on the Coral Academy of Science Middle School (a charter school) by displacing two school buildings and removing space for 250 students. Alternative 3 would not acquire property from the school. Coral Academy staff expressed concern that if Coral Academy Middle School could not continue to operate, its elementary school and high school could be in danger of closing as well (Coral Academy of Science 2018).

The displacement of the Coral Academy of Science Middle School would occur in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), and NDOT would work with school officials to develop the appropriate mitigation to relocate the school and address the continued operation of the Coral Academy of Science. There is an adjacent site to the west that NDOT would acquire under Alternatives 1

and 2, which would provide an opportunity to relocate classrooms (see *Community Impacts Assessment Technical Report,* Appendix D.2 of the Final EIS, for more information on potential direct impacts and mitigation measures).

NDOT assessed the potential indirect effect of relocating Coral Academy Middle School and a student's decision to attend its elementary school and high school based on the middle school's relocation. Currently, the Coral Academy Middle School is approximately 1 mile from the elementary school and 7 miles from the high school. The school draws students from around the Reno/Sparks area. If Coral Academy Middle School were relocated, but within the same general vicinity, it would be unlikely to adversely affect a student's decision to attend the school given the distance between the lower, middle, and upper school. Therefore, the Spaghetti Bowl Project is unlikely to have an indirect effect on the Coral Academy of Science.

2.6.2 Regional Land Use Patterns

The project would not have an indirect effect on regional land use patterns in the primary or secondary APE. As discussed in Section 2.4.3, NDOT conducted a sensitivity analysis to determine if the project would induce traffic growth compared 2040 traffic across the network with and without the project and concluded that 2040 traffic volumes on all freeway links would be similar (within 10 percent) with and without the project (see Attachment 4, Exhibit 4-2). This means the project does not change future population, employment, or household data or their distribution in the model. Therefore, it can be inferred that the project would not change established future land use plans. This conclusion is supported by expert panel (December 2017) input that "there is little correlation between future development and the Spaghetti Bowl Project."

Further, the study area is urbanized, with established land use patterns. It has a mature transportation system composed of an extensive arterial network and numerous connections to the regional freeway system. As a result, mobility provided by operational capacity improvements is not likely to change land use patterns. This is supported by research that has shown that the extent of indirect land use effects is influenced by the maturity of the regional transportation system, and greater effects are associated with new roads compared with existing roads (National Cooperative Highway Research Program 2002; Boarnet and Haughwout 2000). The project is responding to, not driving, planned development in and adjacent to the study area and would not result in an indirect effect on regional land use patterns.

2.6.3 Environmental Justice

If residents (environmental justice populations) are relocated to areas beyond the "McCarran Ring,"[26] they would be farther from the services provided in downtown Reno, such as the Boys

[26] McCarran Boulevard, an arterial ring road serving the cities of Reno and Sparks, is locally referred to as the "McCarran Ring."

& Girls Club and medical services. As noted in the *Community Impacts Assessment Technical Report* (Appendix D.2 of the Final EIS), the bulk of the residential displacements are so far out into the future that NDOT cannot at this time develop a detailed program for where displaced residents would be relocated. Regardless of the timing of the displacements and the circumstances of those who are displaced, the Uniform Act will guide NDOT's mitigation. NDOT will closely monitor the housing market and will take additional steps beyond those required by the Uniform Act to help ensure displaced residents are compensated, including an assessment of public transportation availability from residential relocations beyond the "McCarran Ring" to community services and medical facilities to ensure reasonable access.

Additionally, there may be an indirect effect on environmental justice populations from relocating the Boys & Girls Club and the Community Services Agency if environmental justice populations are no longer able to access the services. Alternative 1 would displace the Boys & Girls Club of Truckee Meadows. Alternatives 2 and 3 would not affect the Boys & Girls Club. As discussed in the *Community Impacts Assessment Technical Report*, mitigation measures include identifying a new location north of I-80 within 1 or 2 miles of the current location and providing transportation to the new facility(s). While some residents may be closer to the relocated Boys & Girls Club and others may be farther, environmental justice populations would have comparable access to the Boys & Girls Club; therefore, there would be no indirect effect on environmental justice populations from the relocation of the Boys & Girls Club.

Alternatives 1 and 2 would displace the Community Services Agency. Alternative 3 would not affect the Community Services Agency. As discussed in the *Community Impacts Assessment Technical Report*, NDOT would compensate the Community Services Agency for the value of the property and relocation costs per the Uniform Act, including finding a suitable location for the Head Start program and other services near its current location. While some residents may be closer to the relocated agency and others may be farther, environmental justice populations on the whole would have comparable access to the relocated Community Services Agency.

2.6.4 Water Resources

With the No Build Alternative, stormwater runoff from the freeway that contains solids, salt from deicing, oil, and grease would continue to drain into the Truckee River, a potable water source, without treatment. Because future traffic volumes with the No Build Alternative are expected to be similar to volumes with Alternatives 1, 2, and 3, the amount of pollutants noted above in stormwater runoff with the No Build Alternative would increase, to the detriment of Truckee River water quality. While Alternatives 1, 2, and 3 would increase the freeway's impervious area and create more stormwater runoff than the No Build Alternative, NDOT would include water quality detention basins as part of each alternative to treat stormwater runoff from all the project's paved area (existing and proposed), along with unpaved and disturbed areas within the construction footprint. The detention basins would be designed to impound runoff for a minimum of 24 hours so that pollutants can settle out of the stormwater

before entering the storm sewers and eventually the Truckee River. Special storm drain inlet structures would be used to control the time stormwater is detained, while allowing the basins to fully drain over a 24-hour period. The potential water quality improvements associated with the proposed detention ponds may have benefits for wildlife living in and along the Truckee River and recreational use by study area residents.

2.6.5 Reno-Sparks Indian Colony

During the scoping process, Reno-Sparks Indian Colony staff expressed concern that elimination and consolidation of the existing interchanges at Mill Street and Second Street/Glendale Avenue, as proposed under Alternative 3, could have an indirect effect on the viability of Reno-Sparks Indian Colony enterprises, including Walmart and two smoke shops, one on Second Street and one on Mill Street (Reno). Alternative 3 would provide access to the Walmart and the smoke shops, albeit with a slightly longer trip (Figure 2-16). The changes in freeway access resulting in increased travel time may affect customer preferences for patronizing the Reno-Sparks Indian Colony's enterprises. The four closest Walmarts are between 4.1 and 8.3 miles (a 9- to 15-minute drive) from the Walmart on Second Street. The nearest Target is 5.2 to 5.4 miles from Walmart (a 9- to 11-minute drive).

Figure 2-16. Access Changes to Reno-Sparks Indian Colony Businesses under Alternative 3

The changes at Mill Street and Second Street/Glendale Avenue freeway access resulting in increased travel time may affect customer preferences for patronizing two Reno-Sparks Indian Colony smoke shops. The next closest smoke shop is at 79 S Wells Avenue (Reno), approximately 1.2 miles from the reconfigured service interchange.

2.7 STEP 6: ASSESS POTENTIAL MINIMIZATION AND MITIGATION MEASURES

Step 6 discusses the potential mitigation measures NDOT and other agencies could use to minimize the indirect effects on public schools and environmental justice populations.

2.7.1 Community Impacts (Public Schools)

If it is determined that students cannot be accommodated at new schools due to relocations prior to 2025, NDOT will work with the Washoe County School District to ensure that students be allowed to continue to attend their current school until accommodation can be made at the new school or the Infrastructure Plan is complete in 2025.

2.7.2 Environmental Justice

NDOT will closely monitor the housing market and may take additional steps beyond those required by the Uniform Act to ensure displaced residents are compensated, including an assessment of public transportation logistics from residential relocations beyond the "McCarran Ring" to community services and medical facilities to ensure the availability of reasonable access.

2.7.3 Reno-Sparks Indian Colony

To mitigate for potential changes in consumer preferences for Reno-Sparks Indian Colony enterprises from the revised freeway interchange access with Alternative 3, directional signs from I-580 to Reno-Sparks Indian Colony enterprises would be installed.

2.8 SUMMARY

Community Impacts (Public Schools). The Spaghetti Bowl Project could contribute to an adverse indirect effect on public schools if displaced students east of Kietzke Lane are relocated to an area with an overcrowded school. Although the Washoe County School District Infrastructure Plan is scheduled to be complete prior to most relocations, if students cannot be accommodated at new schools, NDOT will work with Washoe County School District to allow these students to continue to attend their current school until accommodation can be made at the new school or the Infrastructure Plan is complete in 2025.

The project would not have an adverse indirect effect on the Coral Academy of Science elementary and high schools if the Coral Academy Middle School is successfully relocated under Alternatives 1 and 2.

Regional Land Use Patterns. The project would not have an adverse indirect effect on regional land use patterns, because it would not induce traffic growth or contribute to population, employment, or household growth or distribution.

Environmental Justice. The Spaghetti Bowl Project could contribute to an adverse indirect effect on environmental justice populations if residents are relocated farther from services provided in downtown Reno. NDOT will closely monitor the housing market and will take additional steps beyond those required by the Uniform Act to ensure displaced residents are adequately taken care of, including an assessment of public transportation availability from residential relocations beyond the "McCarran Ring" to community services and medical facilities to ensure reasonable access. The additional mitigation measures are documented in Section 3.2.1.3 of this report and in the Environmental Justice Technical Report, Appendix D.4 of the Final EIS.

If the Boys & Girls Club and the Community Services Agency are successfully relocated, there would not be an indirect effect on the environmental justice populations that use these services. While some residents may be closer to the relocated services and others may be farther, environmental justice populations on the whole would have comparable access to the relocated Boys & Girls Club and Community Services Agency.

Water Resources. The project would contribute to a beneficial indirect effect on Truckee River water quality by providing detention basins to treat stormwater runoff from the project's paved area (existing and proposed), along with unpaved and disturbed areas within the construction footprint.

Reno-Sparks Indian Colony. The changes in freeway access and the related increase in travel time under Alternative 3 may affect customer preferences for patronizing the Reno-Sparks Indian Colony's enterprises. Under Alternative 3, potential changes in customer preferences would be mitigated by signs to direct drivers from I-580 to Reno-Sparks Indian Colony enterprises.

3 CUMULATIVE IMPACTS

Cumulative impacts are impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR § 1508.7).

Several guidance documents were used for this analysis:

- AASHTO, Practitioner's Handbook, Assessing Indirect Effects and Cumulative Impacts Under NEPA (August 2016)
- CEQ, 40 CFR Part 1500-1508
- CEQ, Considering Cumulative Effects under NEPA (1997)
- FHWA, Technical Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents (1987)
- FHWA, Secondary and Cumulative Impact Assessment in the Highway Development Process (April 1992)
- FHWA, Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process (2003)

The analysis involved a two-tiered process: (1) identification of the potential combined direct and indirect effects of the proposed project and other past, present, and reasonably foreseeable public and private activities with or without the proposed action taking place within the cumulative impacts APE; and (2) an assessment of the potential for the project-related effects to have a cumulative impact on socioeconomic and natural resources after mitigation.

3.1 SCOPING CUMULATIVE IMPACTS

As indicated in AASHTO's Practitioner's Handbook *Assessing the Indirect Effects and Cumulative Impacts Under NEPA* (2016), the resources assessed for cumulative impacts "are typically a subset of the range of environmental resources considered in the assessment of direct and indirect effects—in many cases, just two or three topics are chosen for analysis." Resources on which the proposed project would not have an impact, or those for which impacts could be mitigated, are not included in the cumulative impacts analysis.

CEQ's document *Considering Cumulative Effects Under the National Environmental Policy Act* (January 1997) was used to determine which resource topics to analyze for cumulative impacts. The document notes the following about cumulative impacts: "In a broad sense, all the impacts on affected resources are probably cumulative; however, the role of the analyst is to narrow the focus of the cumulative effects analysis to important issues of national, regional, or local significance… Not all potential cumulative effect issues identified during scoping need to be included in an EA [environmental assessment] or an EIS. Some may be irrelevant or inconsequential to decisions about the proposed action and alternatives. Cumulative effects analysis should count what counts, not produce superficial analysis of a long laundry list of issues that have little relevance to the effects of the proposed action or eventual decisions."

3.1.1 Cumulative Impacts Issues

NDOT reviewed direct and indirect effects, assessed stakeholder input, and considered demographic, land use, and natural, recreational, and historic resources information to identify resource topics for cumulative impacts analysis.

Two resource topics require a cumulative impact analysis: affordable housing and fish (Lahontan cutthroat trout). Table 3-1 summarizes the other resources considered but not included in the cumulative impacts analysis.

Table 3-1. Resources Considered but Not Included in the Cumulative Impacts Analysis

Resource	Cumulative Impacts Assessed?	Comment
Traffic Noise	No	The project would not generate noise over the no-build condition after mitigation; therefore, it would not contribute to a cumulative impact.
Air Quality	No	Air quality is a regional issue that has many contributing sources. The project would not create impacts greater than the no-build conditions; therefore, it would not contribute to a cumulative impact.
Visual Character/ Aesthetics	No	The project is in a developed urban corridor around I-80 and I-580/US 395. Visual character/aesthetics are not anticipated to have a substantial effect on alternative selection. Furthermore, data could not be reasonably obtained that would describe the visual character/aesthetic impacts of other projects. The project would meet NDOT aesthetic requirements.
Community Impacts (residential, commercial, community facilities/services)	Yes, with respect to affordable housing; no with respect to schools	The project would not induce economic or regional growth and therefore would not cause new students to enter the school district. Residential relocations with the phased approach to project implementation are anticipated to occur after the Washoe County School District has completed its infrastructure improvements. No other projects were identified that would displace residents in neighborhoods affected by the Spaghetti Bowl Project; therefore, there would be no cumulative impacts.

Resource	Cumulative Impacts Assessed?	Comment
Regional Land Use Patterns	No	Although the Reno-Sparks area is growing, the project would not induce economic or regional growth, and therefore it would not cause changes to regional land use patterns. Strong local and regional land use controls will direct future development to areas that are served by municipal sewer and water, consistent with local and regional plans.
Environmental Justice	No	Based on coordination with local agencies, no projects were identified that would result in adverse impacts on the same environmental justice neighborhoods/ communities being affected by the Spaghetti Bowl Project improvements; therefore, there would be no cumulative impacts.
Transportation Service	No	The Spaghetti Bowl Project is not anticipated to result in a mode shift, nor are there other present or reasonable foreseeable future projects that are expected to draw traffic from the Spaghetti Bowl Project. The projected difference between the future build and no-build traffic volumes in the study area is negligible.
Water Resources (surface water and wetland)	No	The project would have no direct or indirect impacts to water resources after mitigation. Therefore, it would not contribute to cumulative impacts.
Hazardous Materials	No	The project would have no direct or indirect impacts to hazardous materials after mitigation. Therefore, it would not contribute to cumulative impacts.
Cultural Resources	No	Direct impacts to historic properties will be mitigated and indirect impacts are not likely to occur. Therefore, the project would not contribute to cumulative impacts. See *Section 106 of the National Historic Preservation Act Assessment of Effects Report* for more information.

3.1.2 Cumulative Impacts Study Area

The study area for the cumulative impacts analysis was identified based on the resources that have been selected for analysis. Strategies NDOT employed in determining the study area include:

- Input from the NEPA scoping process and expert panel interviews
- Consultation with resource specialists at the U.S. Fish and Wildlife Service who have knowledge about resources and regulatory mandates
- Review of boundaries that were previously established for a resource in the project-specific analysis

The cumulative impacts study area for each evaluated resource are as follows and are illustrated in Figures 3-1A and 3-1B:

- Community impacts (affordable housing) – neighborhoods within 1 mile of the study area
- Federally protected fish – Truckee River (beginning at Fleisch Diversion Dam and continuing downstream to Pyramid Lake)

3.1.3 Timeframe for the Analysis

One of the goals of scoping is to determine a timeframe for the analysis. The timeframe for the analysis generally coincides with the design year, but also reflects the availability of data. This timeframe is typically consistent with the planning horizons used for regional land use and transportation planning purposes. In addition, this timeframe is long enough for cumulative impacts to unfold, but it is not so far into the future that the effects become too difficult to reasonably anticipate. The timeframe with regard to cumulative effects is 2035.[27]

3.1.4 Identify Past, Present, and Reasonably Foreseeable Future Actions

Reno, and later Sparks, developed around the Union Pacific Railroad that travels east-west across the study area. I-80 parallels the railroad. In Sparks, I-80 is directly adjacent to the railroad, and in Reno it is a few blocks north of the railroad. Reno and Sparks developed with more residences north of the Union Pacific Railroad/I-80 corridor than south of it. While there are scattered pockets of residences south of I-80, most notably the Reno-Sparks Indian Colony, the study area immediately south of I-80 is more commercial. The Reno-Tahoe International Airport takes up much of the study area south of I-80.

US 395 north of I-80 divides residential areas, mainly between I-80 and N McCarran Boulevard. South of I-80 land use adjacent to the project is generally commercial with residential housing adjacent to the commercial uses. The Reno-Tahoe International Airport is east of I-580.

[27] The *Truckee Meadows Housing Study* (TMRPA 2017) was integral to the analysis of the cumulative impacts on affordable housing. The study relied on demographic information from the regionally adopted Washoe County Consensus Forecast (TMRPA 2016), with a forecast year of 2035. Transportation projects planned through 2040 were considered during the analysis and are included in Table 3-2, and on Figures 3-2 and 3-3 as identified in the RTC's current long-range plan; however, the analysis timeframe is consistent with The Regionally Adopted Consensus Forecast. Following publication of the Draft EIS, the 2018-2038 Consensus Forecast was published. The new forecast was reviewed and does not vary enough to change the conclusions of this analysis. Therefore, the timeframe with regard to cumulative effects will remain 2035.

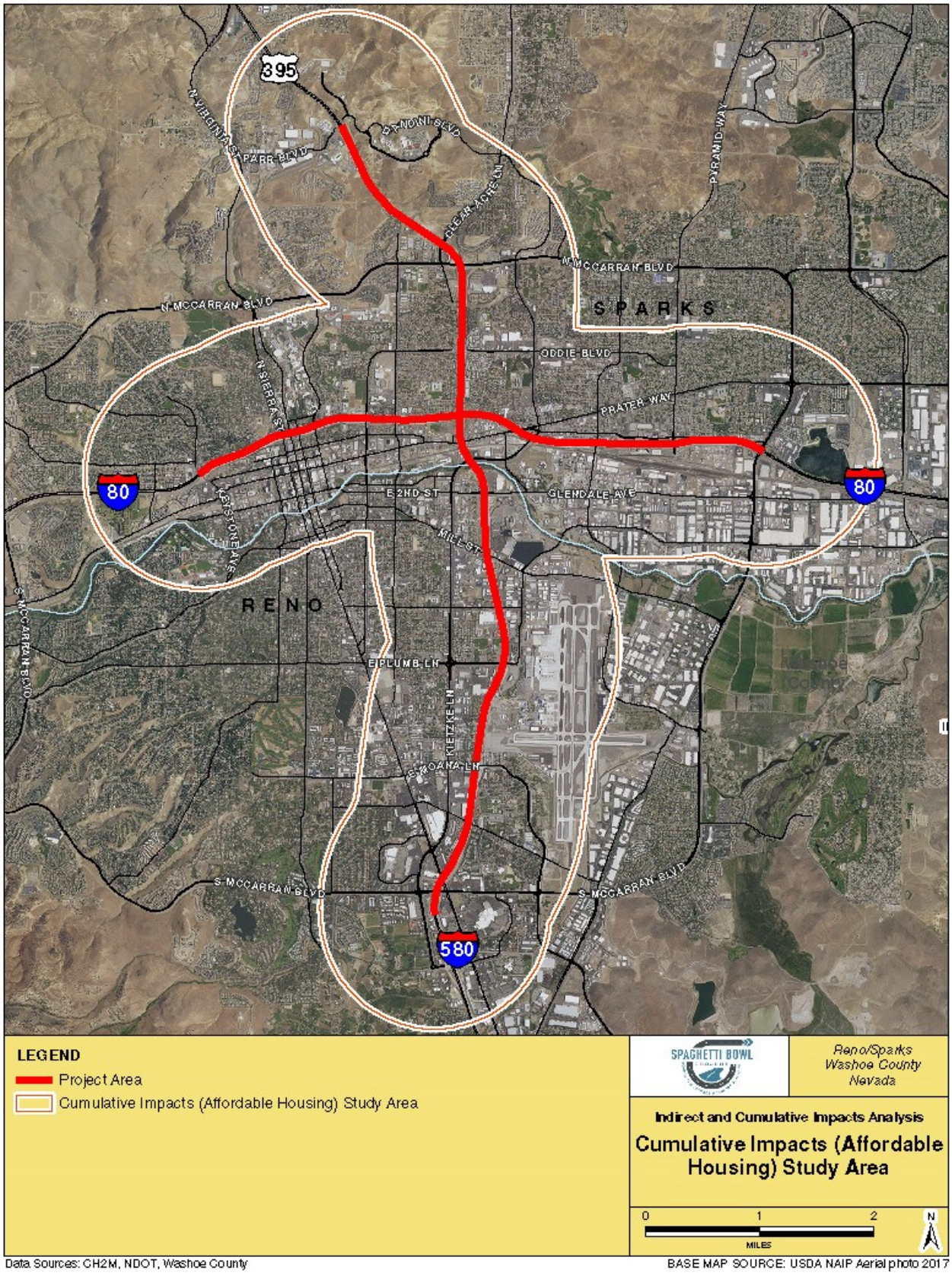


Figure 3-1A. Cumulative Impacts (Affordable Housing) Study Area

Figure 3-1B. Cumulative Impacts (Fish) Study Area

Construction of I-580/US 395, which occurred from the late 1960s into the 1980s, created barriers between neighborhoods and reduced opportunities for interaction; however, it also provided opportunities for growth and development within Reno and Sparks. Because I-80 generally follows the Union Pacific Railroad, it did not bisect residential areas. However, it did separate the University of Nevada, Reno and downtown Reno and separated some residences north and south of I-80 near Sutro Street and Wells Avenue. In Sparks, the Union Pacific Railroad/I-80 corridor is even more distinct, and there are only a few residences south of I-80 in the study area. North of I-80 is almost all residential and neighborhood-scale retail. Sparks' downtown commercial district (Victorian Square) is on the north side of I-80 between Pyramid Way and Rock Boulevard.

Table 3-2 lists past, present, and reasonably foreseeable future actions that may contribute to cumulative impacts within the cumulative impacts study areas. Figure 2-13 identifies the locations of planned developments, and Figures 3-2 and 3-3 identify the locations of transportation projects.

Table 3-2. List of Past, Present, and Reasonably Foreseeable Future Actions

Project	Past, Present, and Reasonably Foreseeable Actions	Label on Figure 2-13, 3-2, or 3-3 (if applicable)
Transportation – Roads		
Spaghetti Bowl Paving. This project rehabilitated the aging pavement at the Spaghetti Bowl.	Past (completed August 2017)	
I-80 Robb Drive to Vista Boulevard. This project improved capacity and safety at several locations along I-80 in the study area by widening shoulders between Keystone Avenue and Prater Way, just east of the Spaghetti Bowl, and widening off-ramps at Virginia Street, Rock Boulevard, and McCarran Boulevard. This project did not bring shoulders to NDOT standards in all locations; it implemented improvements within the existing right-of-way, improved safety, and provided better connectivity.	Past (completed December 2012)	
I-580 Widening Northbound from Moana Lane to Spaghetti Bowl and Off-Ramp Widening Northbound I-580 to East- and Westbound I-80. This project added new freeway lanes, shoulders, and ramp connections on northbound I-580, as well as widening bridges. This project is a long-term solution and will tie into the planned Spaghetti Bowl redesign.	Past (completed November 2011)	
I-580/Moana Lane Interchange. NDOT reconstructed the I-580/Moana Lane interchange and widened Moana Lane as a long-term solution to ease congestion and provide better access to businesses along Moana Lane.	Past (completed December 2012)	
I-580/Meadowood Mall Way Interchange. New partial interchange and frontage roads as a long-term solution to reduce congestion at the S McCarran Boulevard and S Virginia Street intersection near Meadowood Mall.	Past (completed December 2012)	

Project	Past, Present, and Reasonably Foreseeable Actions	Label on Figure 2-13, 3-2, or 3-3 (if applicable)
I-580 Freeway from Mt. Rose Highway to Washoe Valley. Construction of the I-580 Freeway extension between Reno and Carson City was completed in 2012. The 8.5-mile project alleviated congestion and reduced crashes along US 395 through Pleasant Valley.	Past (completed in August 2012)	
SouthEast Connector Project. This new 5.5-mile arterial—from the intersection of Sparks Boulevard and Greg Street one-half mile south of I-80, south to S Meadows Parkway and Veterans Parkway—is a six-lane freeway with multiuse paths. It adds capacity to the regional transportation network, especially in the southeast part of the RTC's planning area.	Present (opened July 2018)	8 (Figure 3-3)
Pyramid Highway. At McCarran Boulevard, this project will improve capacity, safety, and multimodal access.	Present (completed in spring 2018)	
Dolores Drive. This project will provide a new two-lane road from existing Dolores Drive west to Lazy 5 Parkway.	Future project (2017-2021)	1 (Figure 3-3)
Kiley Parkway. This project will provide a new two-lane road from Wingfield Hills Road to Henry Orr Parkway.	Future project (2017-2021)	3 (Figure 3-3)
Wingfield Hills Road. This project will provide a new four-lane road from existing Wingfield Hills Road west to David Allen Parkway.	Future project (2017-2021)	13 (Figure 3-3)
US 395. This project will widen US 395 to six lanes from N McCarran Boulevard to Lemmon Drive.	Future project (2017-2021)	50, 51 (Figure 3-2, Figure 3-3)
Lazy 5 Parkway. This project will provide a new two-lane road from W Sun Valley arterial to Pyramid Highway.	Future project (2017-2026)	4, 21 (Figure 3-3)
Lemmon Drive. This project will widen the road from four to six lanes from US 395 to Military Road; widen two to four lanes from Fleetwood Drive to Arkansas Street.	Future project (2017-2026)	5-6, 22-23 (Figure 3-3)
Stonebrook Parkway. This project will provide a new two-lane road from La Posada Drive to N/S Connector Road (2017-2017). Stonebrook Parkway will then be extended (new two-lane road) from N/S Connector Road to Pyramid Highway (2022-2026). N/S Connector Road is new road (2022-2026) from Stonebrook Parkway to Winfield Hills Road.	Future project (2017-2026)	9, 32 (Figure 3-3)
Pyramid Highway/US 395 Connector. This new high-speed/limited-access arterial from US 395 to Pyramid Highway, which will convert approximately 6 miles of existing Pyramid Highway (SR 445) from an arterial to a six-lane, high-speed, limited-access arterial, will alleviate current and future congestion in Sparks and Spanish Springs. It will serve future growth areas and provide additional east-west connectivity.	Future project (2017-2040)	43 (Figure 3-2) 7, 43-47 (Figure 3-3)
Arrowcreek Parkway. This project will widen the road from two to four lanes from Wedge Parkway to Zolezzi Lane.	Future project (2022-2026)	14 (Figure 3-3)

Project	Past, Present, and Reasonably Foreseeable Actions	Label on Figure 2-13, 3-2, or 3-3 (if applicable)
Buck Drive. This project will widen the road from two to four lanes from Lemmon Drive to N Hills Boulevard.	Future project (2022-2026)	15 (Figure 3-3)
Damonte Ranch Parkway. This project will provide a new two-lane road from Veterans Parkway to Rio Wrangler Parkway.	Future project (2022-2026)	16 (Figure 3-3)
Geiger Grade. This project will widen the road from two to four lanes from Toll Road to Rim Rock.	Future project (2022-2026)	17 (Figure 3-3)
Geiger Grade Realignment. This project will provide a new four lane road.	Future project (2022-2026)	18 (Figure 3-3)
N/S Connector Road. This project will provide a new two-lane road from Stonebrook Parkway to Wingfield Hills Road.	Future project (2022-2026)	27 (Figure 3-3)
Loop Road. This project will provide a new two-lane road from Salomon Circle to Eastern Slope Road.	Future project (2022-2026)	24 (Figure 3-3)
Military Road. This project will widen Military Road from two to four lanes from Lemmon Drive to Echo Avenue.	Future project (2022-2026)	25 (Figure 3-3)
Moya Boulevard. This project will widen the road from two to four lanes from Red Rock Road to Echo Avenue.	Future project (2022-2026)	26 (Figure 3-3)
Parr Boulevard. This project will provide interchange improvements.	Future project (2022-2026)	28 (Figure 3-2, Figure 3-3)
Red Rock Road. This project will widen Red Rock Road from two to four lanes from Moya Boulevard to Evans Ranch Access.	Future project (2022-2026)	30 (Figure 3-3)
Sky Vista Parkway. This project will widen the parkway from two to four lanes from Lemmon Drive to Silver Lake Road.	Future project (2022-2026)	31 (Figure 3-3)
White Lake Parkway. This project will widen the parkway from two to four lanes between US 395 ramp terminals.	Future project (2022-2026)	33 (Figure 3-3)
I-80. This project will implement capacity and operational improvements from W McCarran Boulevard to Vista Boulevard.	Future project (2027-2040)	36 (Figure 3-2, Figure 3-3)
Kirman Avenue. This project will widen the road from three to four lanes from Mill Street to Second Street.	Future project (2027-2040)	38 (Figure 3-3)
McCarran Boulevard. This project will widen the road from four to six lanes from Seventh Street to N Virginia Street.	Future project (2027-2040)	39 (Figure 3-3)
McCarran Boulevard. This project will widen the road from four to six lanes from El Rancho Drive to Rock Boulevard.	Future project (2027-2040)	40 (Figure 3-3)
McCarran Boulevard. This project will widen the road from four to six lanes from Sky Mountain Drive to I-80.	Future project (2027-2040)	41 (Figure 3-3)
Mira Loma Drive. This project will widen the road from two to four lanes from McCarran Boulevard to SouthEast Connector.	Future project (2027-2040)	42 (Figure 3-3)

Project	Past, Present, and Reasonably Foreseeable Actions	Label on Figure 2-13, 3-2, or 3-3 (if applicable)
Eagle Canyon Extension. This project will provide a new four-lane arterial from Eagle Canyon to Lemmon Drive; Lemmon Drive to Military Road.	Future project (2027-2040)	34, 35 (Figure 3-3)
Sutro Street. This project will widen the road from two to four lanes from McCarran Boulevard to Sunvilla Boulevard.	Future project (2027-2040)	48 (Figure 3-2, Figure 3-3)
Sutro Street Extension. This project will provide a new two-lane road from Sunvilla Boulevard to Clear Acre Lane.	Future project (2027-2040)	49 (Figure 3-2, Figure 3-3)
US 395. This project will widen US 395 to six lanes from Lemmon Drive to Stead Boulevard.	Future project (2027-2040)	52 (Figure 3-3)
Vista Boulevard. This project will widen Vista Boulevard from four to six lanes from I-80 to Prater Way.	Future project (2027-2040)	54 (Figure 3-3)
West Sun Valley Arterial. This project will provide a new four lane road from Dandini Boulevard to Eagle Canyon.	Future project (2027-2040)	55 (Figure 3-2, Figure 3-3)
Transportation – Transit		
RTC RAPID Lincoln Line. This project is a 3.1-mile bus rapid transit line in the Fourth Street/Prater Way Corridor linking the business districts of Reno and Sparks. The project includes eight passenger stations (four in each direction), off-vehicle fare collection, transit signal priority, real-time schedule information at stations, a bus charging facility, new sidewalks, and bicycle lanes.	Present (completed spring 2019)	5 (Figure 3-2)
RTC RAPID Virginia Line Extension. This transit project will improve connectivity and efficiency along Virginia Street from downtown Reno to Meadowood Mall. Two other bus rapid transit lines are in the planning and design phase: Extension to University of Nevada, Reno and Lincoln Line (downtown Reno to downtown Sparks). These routes would not use I-580 or I-80 but would cross under one or both freeways in the study area.	Present (construction began in 2018)	8 (Figure 3-2)
Transportation – Bicycle, Pedestrian, Multimodal		
Glendale Avenue (Kietzke Avenue to McCarran Boulevard). The project will reconstruct pavement and provide multimodal improvements.	Present (completed December 2017)	11 (Figure 3-2)
Ninth Street/G Street (Wells Avenue to El Rancho Drive). This project will enhance sidewalks and bike lanes.	Future project (2027-2040)	2 (Figure 3-2)
Oddie Boulevard/Wells Avenue (I-80 to Pyramid Highway). This project will provide multimodal improvements (corridor study complete).	Future project (2017-2021)	3 (Figure 3-2)
Second Street (Keystone Avenue to I-580). This project will provide multimodal improvements (corridor study complete).	Future project (2017-2021)	10 (Figure 3-2)
W Second Street (Reno)/Keystone Avenue to Galletti Way (Sparks). This project will enhance sidewalks, landscaping, bike lanes.	Future project (2022-2026)	10 (Figure 3-2)

Project	Past, Present, and Reasonably Foreseeable Actions	Label on Figure 2-13, 3-2, or 3-3 (if applicable)
Kietzke Lane (Virginia Street to Galletti Way). This project will provide multimodal improvements (corridor study complete)**.**	Future Project (2017-2021)	7 (Figure 3-2)
Mill Street/Terminal Way: Reno-Tahoe International Airport to Lake Street (downtown Reno). This project will provide multimodal improvements; construction (corridor study complete).	Future project (2017-2021)	6 (Figure 3-2)
Victorian Avenue (16th Street to Pyramid Way). This project will provide bicycle lanes.	Future project (2017-2021)	12 (Figure 3-2)
Vine Street (Riverside Drive to University Terrace). This project will provide bicycle lanes.	Future project (2017-2021)	1 (Figure 3-2)
Center Street (S Virginia to I-80). This project will widen sidewalks and provide bicycle lanes.	Future project (2017-2021)	4 (Figure 3-2)
Sierra Street (California Avenue to Ninth Street). This project will widen sidewalks and provide bicycle lanes**.**	Future project (2017-2021)	9 (Figure 3-2)
Transportation – Aviation		
Reno-Tahoe International Airport. This project will expand the terminal from two concourses to four concourses to accommodate new gates.	Future project (dictated by demand; 2021-2036)	
Reno-Tahoe International Airport. This project will provide new or expanded parking, added incrementally to bring the total number of parking spaces to approximately 4,300 spaces.	Future project (2021-2036)	
Reno-Tahoe International Airport. This project will relocate air cargo facilities to the southwest quadrant, near Runway 16R-34L, to accommodate forecasted growth in air cargo activity.	Future project (2021-2036)	
Land Use and Development		
Tahoe Reno Industrial Center (TRIC). The Tahoe Reno Industrial Center is a 107,000-acre park that encompasses a developable 30,000-acre complex. The park is intended to be a mixed-use, nonresidential development consisting of a wide range of industrial, office, and commercial businesses. There is approximately 11 million square feet of industrial space currently in use by almost 130 companies. Notable tenants include Tesla, Google, Jet.com, Walmart, and Switch.	Current and future project (development ongoing)	
University of Nevada, Reno Campus Gateway Precinct/University District. The Campus Gateway Precinct is expanding University of Nevada, Reno between Ninth and Eighth streets, and Virginia and Evans streets. The remainder of the University District is identified for redevelopment from I-80 to downtown Reno. The University would like to see University-related housing and commercial and retail development and to improve physical and economic connections to downtown Reno.	Current and future project (2017-2024)	

Project	Past, Present, and Reasonably Foreseeable Actions	Label on Figure 2-13, 3-2, or 3-3 (if applicable)
Meridian 120. This project is a 783-acre mixed-use development along I-80, 8 minutes west of downtown Reno. Tourist, commercial, industrial, retail, and residential zoning is currently in place, and the development will create a vibrant community for nearby campus employees to live, work, and play. The development will serve as a gateway to Reno from California.	Current and future project (development ongoing)	39 (Figure 2-13)
Rancharrah. Located south of the Spaghetti Bowl along I-580, Rancharrah is a 141-acre master-planned community with abundant amenities.	Current and future project (development ongoing)	36 (Figure 2-13)
Park Lane. Park Lane is a 45.6-acre master-planned, mixed-use community, south of the Spaghetti Bowl along I-580 at Plumb Lane and S Virginia Street.	Current and future project (development ongoing)	
Summit Club. The project includes a 584-unit apartment complex adjacent to The Summit outdoor shopping center near Mt. Rose Highway and I-580. It will have a blended mix of 80 percent market-rate housing and 20 percent workforce housing, the first of its kind in northern Nevada. The apartments will be constructed in configurations of 12, 18, and 26 one- and two-bedroom units.	Current and future project (development ongoing)	
Woodland Village. This is a 2,458-unit development in Cold Springs; 430 units remain to be constructed. A Tentative Map request for the development plan has been approved.	Current and future project (development process ongoing)	74 (Figure 2-13)
Sonoma Highlands. This is a 2,510-unit planned development in the City of Sparks.[a]	Current and future project (development process ongoing)	19 (Figure 2-13)
Wingfield Springs. This is a 2,546-unit planned development in the City of Sparks; 492 units remain to be constructed.[a]	Current and future project (development process ongoing)	8 (Figure 2-13)
Pioneer Meadows. This is a 2,756-unit planned development in the City of Sparks; 1,630 units remain to be constructed.[a]	Current and future project (development process ongoing)	7 (Figure 2-13)
Mortensen-Garson. This is a 3,000-unit planned development in the City of Reno near Verdi; 2,996 units remain to be constructed.[a]	Current and future project (development process ongoing)	32 (Figure 2-13)
Double Diamond. This is a 3,300-unit planned development in the City of Reno. It is south of the Spaghetti Bowl along I-580.[a]	Current and future project (development process ongoing)	64 (Figure 2-13)

Project	Past, Present, and Reasonably Foreseeable Actions	Label on Figure 2-13, 3-2, or 3-3 (if applicable)
Kiley Ranch North. This is a 4,463-unit planned development in the City of Sparks.[a]	Current and future project (development process ongoing)	11 (Figure 2-13)
Damonte Ranch. This is a 4,905-unit planned development in the City of Reno. It is south of the Spaghetti Bowl along I-580.[a]	Current and future project (development process ongoing)	88 (Figure 2-13)
Evans Ranch. This is a 5,679-unit planned development in the City of Reno. It is along U.S. 395 N, near Cold Springs.[a]	Current and future project (development process ongoing)	24 (Figure 2-13)
Downtown Sparks Redevelopment. Ongoing and future redevelopment is occurring in Victorian Square, situated north of I-80, bounded by Victorian Avenue to the south, Fifteenth Street to the west, and Victorian Plaza Circle to the north and east. The plans are to create a vibrant, mixed-use downtown.	Current and future project (development process ongoing)	
StoneGate. This project is a 1,387-acre master-planned community 13 miles from the Spaghetti Bowl along US 395 N, off North Virginia Street on the historic Heinz Ranch property. It will provide for 4,135 dwelling units.	Future project	97 (Figure 2-13)
Renown Operations Building. Renown Health purchased the old Lowe's building on Oddie Boulevard, in which it plans to house back-office operations, including the contact center, warehouse, population health management organization, information technology, and revenue cycle.	Future project	
Bridge, Flood Management, and Fish Passage Projects		
Truckee River Flood Management Project. This project will reduce flood damage by replacing bridges to increase Truckee River channel capacity, excavating floodplain terraces to improve floodwater storage, and restoring ecosystem functions and creating habitat for native species.	Current and future project	Various locations from downtown Reno through the Lower Truckee River
USFWS Fish Passage Projects. The U.S. Fish and Wildlife Service (USFWS) is planning several fish passage projects at four dams that currently block within-stream movement and upstream movement from Pyramid Lake. The dams will be rehabilitated from 2018 through 2022. The Derby Dam will also be rehabilitated in the next several years.	Current and future project	Figure 3-1B
[a] The table identifies PUDs and Tentative Maps with 2,500 units or greater in the TMSA. There are an additional 182 PUDs and Tentative Maps within the study area that will be considered in the analysis, as appropriate. The complete list can be found in Attachment 6.		

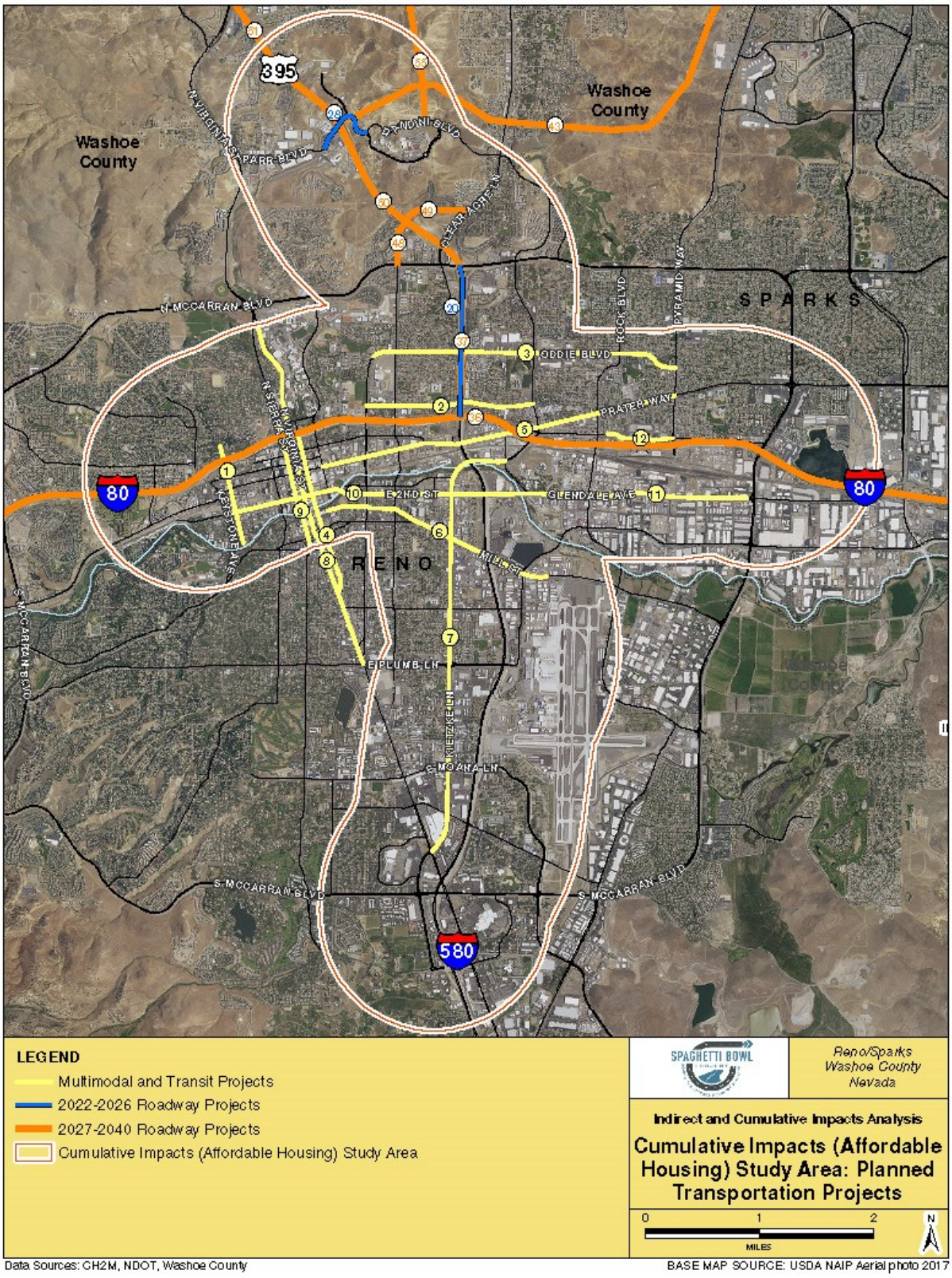


Figure 3-2. Cumulative Impacts (Affordable Housing) Study Area: Planned Transportation Projects (RTC 2017-2040)

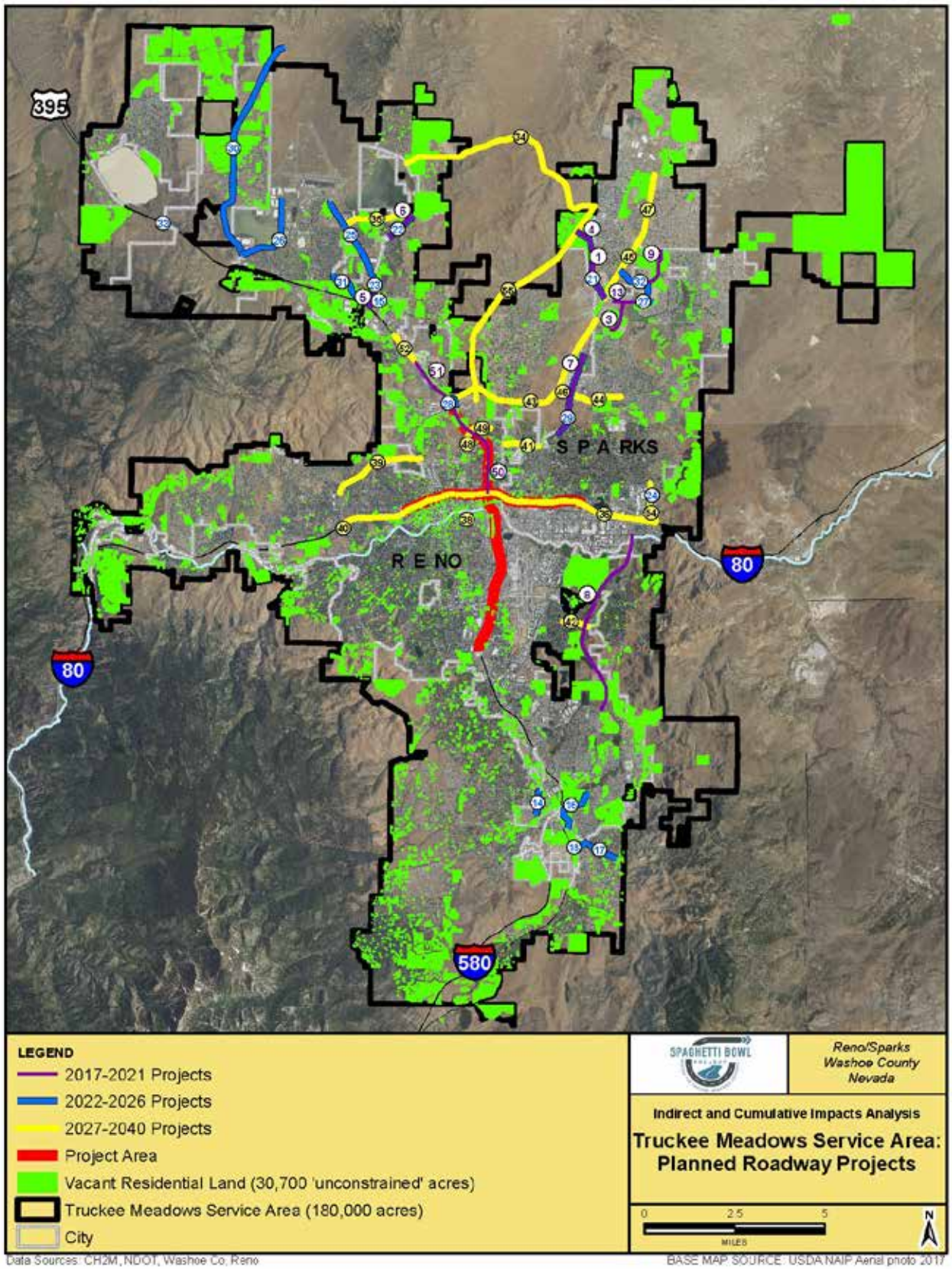


Figure 3-3. Truckee Meadows Service Area: Planned Freeway Projects (RTC 2017-2040)

3.2 Describe the Affected Environment, and Determine the Environmental Consequences and Potential Mitigation Measures

This section describes the resources that could experience cumulative impacts as a result of Alternatives 1, 2, and 3, and other past, present, and reasonably foreseeable actions listed in Section 3.1.4. For each resource, the affected environment is summarized first, including an established baseline condition and the resource's capacity to withstand stress in relation to regulatory thresholds, if applicable. Where possible, a quantitative assessment of the current health or condition, and the trend it is experiencing, is provided. When quantitative data were not available, a qualitative discussion of the resource's health or condition, and trend, is presented. Then, an evaluation of the environmental consequences is conducted for each resource. This includes examining the cause-and-effect relationship between human activities and affected resources and determining the magnitude and significance of the cumulative impacts. The evaluation also considers avoidance, minimization, and mitigation measures NDOT could undertake for Alternatives 1, 2, and 3 to minimize cumulative impacts to the greatest practical extent. It also considers other local, state, and federal ordinances and laws that can further manage cumulative impacts resulting from the project's potential direct and indirect effects.

The following resources have been assessed for potential cumulative impacts:

- Community impacts with respect to affordable housing
- Fish (with a focus on Lahontan cutthroat trout and cui-ui)

3.2.1 Community Impacts – Affordable Housing

3.2.1.1 Affected Environment

Resource Condition and Trends

The number of housing units in the TMSA increased by nearly 50,000 units between 2000 and 2015, as shown in Table 3-3. This is an increase of nearly 40 percent over the 15-year period. The TMRPA Housing Study (TMRPA 2017) assessed the changes in the housing mix between 2000 and 2015 based on five categories of dwelling unit densities (see inset.) Highlights of the historical trends include:

- More units were built in moderate-density single-family housing (52 percent) and high-density single-family/low-density multifamily housing (21 percent) in the TMSA than on average prior to 2000.

- High-density multifamily housing accounts for 15 percent of Reno's housing stock but only 4 percent of housing built since 2000. High-density multifamily units supply affordable housing for families earning less than 80 percent of the area median income.
- Most new housing developed in Sparks was moderate-density single-family.
- Nearly all of the low-density single-family housing in the TMSA is in unincorporated Washoe County. Unincorporated Washoe County has no high-density multifamily units.

Housing Density Classifications

- **Low-Density Single-Family:** Two or fewer dwelling units per acre. Nearly all housing is single-family detached.
- **Moderate-Density Single-Family:** Between 2.01 and 7.26 dwelling units per acre. Most of the housing is single-family detached.
- **High-Density Single-Family/Low-Density Multifamily:** Between 7.27 and 14.5 dwelling units per acre. Two-thirds of the housing is single-family, and the remainder is a mix of single-family attached (i.e., townhouses) and multifamily.
- **Moderate-Density Multifamily:** Between 14.51 to 30 dwelling units per acre. Most of the housing is multifamily.
- **High-Density Multifamily:** 30 dwelling units per acre. Nearly all housing is multifamily.

Source: TMRPA 2017, Appendix B.

The study found that the longer trends (1940 to 2015) in the TMSA were similar to changes across the nation, with respect to average lot size, which decreased, while the average single-family dwelling size increased. The analysis of homeownership rate showed the market to be relatively stable over the 2000 to 2013 period for Washoe County (56 percent), Reno (45 percent), and Sparks (57 percent).

Table 3-3. Total Dwelling Units, Truckee Meadows Services Area (2000 and 2015)

Area	Number of Units		Change (2000 – 2015)	
	2000	2015	Number	Percent
Unincorporated Washoe County	22,502	30,838	8,336	37%
Reno	77,156	104,999	27,843	36%
Sparks	26,738	39,087	12,349	46%
Total	**126,396**	**174,924**	**48,528**	**38%**

Source: TMRPA 2017.

Between 2000 and 2016, the City of Reno's population increased by 31.4 percent (56,641 new residents) and the City of Sparks' population increased by 42.8 percent (28,372 new residents). Over the next 20 years, the TMRPA forecasts population to increase in the region, with the City of Reno's population forecast to increase by 74,691, the City of Sparks population forecast to increase by 27,498, and unincorporated Washoe County's population is forecast to increase by 16,417 (TMRPA 2017). This growth will drive future demand for housing.

The TMRPA Housing Study also estimated that by 2035, 50,636 new units will be needed in the TMSA to accommodate forecast future growth in the region, approximately the same number

of housing units that were developed between 2000 and 2015. Table 3-4 illustrates the allocation[28] of future dwelling units to each jurisdiction within the TMSA. Table 3-5 shows the housing mix for forecasted growth. The Housing Study also estimated the capacity of vacant residential land, as well as land with infill and redevelopment potential, and found capacity for more than 90,000 new dwelling units in the TMSA under current zoning designations.

Table 3-4. Projected Units in TMSA Based on Jurisdictional Splits (2015-2035)

Jurisdiction	Future Population	Future Units Needed Based on Population	Vacant Units[a]	Total Future Units Needed
Reno	74,691	28,727	3,160	31,888
Sparks	27,498	10,576	1,163	11,739
Unincorporated Washoe County	16,417	6,314	695	7,009
Totals	**118,606**	**45,618**	**5,018**	**50,636**

[a] Washoe County assumed a vacancy rate of 11 percent.

Source: *Truckee Meadows Housing Study*, Exhibit C-6 (TMRPA 2017).

Table 3-5. Housing Mix for Forecasted Growth, New Dwelling Units in TMSA (2015 to 2035)

Housing Density	New Dwelling Units	Percent of Total
Low-Density Single-Family	5,554	11%
Moderate-Density Single-Family	25,923	51%
High-Density Single-Family/Low-Density Multifamily	10,144	20%
Moderate-Density Multifamily	6,483	13%
High-Density Multifamily[a]	2,603	5%

[a] High-density multifamily units supply affordable housing for families earning less than 80 percent of the area median income. Additionally, lower-income households are likely to live in older, existing housing, including housing at the fringe of the region.

Note: This table represents the classic scenario presented in the *Truckee Meadows Housing Study* (TMRPA 2017), which assumes continuation of past trends with large amounts of single-family housing at the urban periphery. Given the current development trajectory, it is appropriate to highlight this scenario as it is representative of likely future trends.

Source: *Truckee Meadows Housing Study*, Figure 7 Housing Type Mixes, 2035 (TMRPA 2017).

Although the Housing Study found that there is more than enough capacity to accommodate future growth, it identified a potential shortfall in some housing types to meet future demands, referred to as the "missing middle." The type of housing that could fill this gap are single-family housing on smaller lots, cottage housing, duplexes, townhouses, and apartments. The study's initial look at financial feasibility found that building affordable housing is difficult under current market conditions. It also found that few of the forecasted housing units will be affordable to

[28] TMRPA used a jurisdictional split methodology developed in the Washoe County Consensus Forecast to allocate future units to each jurisdiction's TMSA (TMRPA 2016).

residents with incomes below $40,000, and this is especially true for residents with incomes below $20,000. Households earning between $20,000 and $40,000 income per year can afford monthly housing costs between $500 and $1,000. The Fair Market Rent[29] in Washoe County for a two-bedroom apartment is $924 (TMRPA 2017); households earning less than $40,000 per year cannot afford this rate without being cost burdened.

The City of Reno completed a housing market needs analysis in 2016 (City of Reno 2016) and found that there appears to an adequate supply of homes for households earning between 80 and 120 percent of the area median income, while the percent of houses sold to households earning less than 80 percent of the area median income was less than 10 percent. Table 3-6 identifies the number of home sales in Reno assessed in the study at each income level.

Table 3-6. Number of Home Sales in Reno, by Income Level

Area Median Income[a] (AMI)	Maximum Household Income	Affordable Sales Price	Number of Homes (2014-2015)	% of Sales
50% of AMI and below	$22,832	$60,600	140	3%
50% of 80% of AMI	$36,530	$119,900	304	6%
80% to 100% of AMI	$45,663	$158,800	328	6%
100% to 120% of AMI	$54,796	$197,700	571	11%
Above 120% of AMI	No Maximum	$197,000+	3,813	74%

Source: City of Reno 2016.

[a] AMI = area median income

The recession in 2008 – 2009 halted development in the Truckee Meadows region; however, development has rebounded since then. Currently, the housing market is lagging population growth in the region, creating a housing shortage. In March 2018, the region had an approximately 1.1-month supply of inventory (Reno/Sparks Association of Realtors 2018). Some realtors consider a 3- to 6-month supply of inventory as balanced for sellers and buyers. Developers are taking a conservative approach to development and are not rushing to construct new homes (Valley 2017).

As discussed in Section 2.4.1.5, Housing, local jurisdictions are committed to increasing the supply of affordable housing to meet the needs of lower-income residents. *Reimagine Reno*

[29] The Fair Market Rent rate is established by the Department of Housing and Urban Development to be used as a basis for paying federal housing assistance programs. It is defined as the 40th percentile of rents paid by recent movers (renters who moved in the last 24 months) in a given FMR area. FMR rent prices are slightly below the median prices; the median rent would be the 50th percentile.

Master Plan (City of Reno 2017a) identifies strategies to increase affordable housing and workforce housing, such as:

- Monitor and periodically update the Land Use Plan to ensure the city has an adequate supply of land designated for a wide variety of housing types based on demand.
- Ensure that the Land Use Plan accommodates a mixture of housing types and sizes in all quadrants of the city, including attached and detached home types and at varying densities and price points.
- Develop a targeted housing strategy to facilitate and incentivize the creation of affordable housing units for low-income residents and attainable housing for the city's workforce. Update the strategy periodically to address changing needs.
- Encourage the development of affordable and workforce housing by providing incentives for projects that incorporate units affordable to income levels identified in the housing strategy.
- Support the preservation and rehabilitation of existing subsidized affordable and workforce housing units through use of incentives and grant funding.
- Promote developments and rehabilitation programs that expand housing options that are accessible to seniors and persons with disabilities, through the use of universal design and visibility principles.
- Work cooperatively with the City of Sparks, Washoe County, and other partners to pursue regional efficiency in all matters related to affordable housing:
  - Pursue funding regionally at all levels
  - Publicize and market affordable housing opportunities throughout the region, including rehabilitation and funding
  - Work to preserve viable affordable housing stock and ensure long-term affordability for new units built with financial assistance

Ignite Sparks Comprehensive Plan (City of Sparks 2016) includes housing and affordability goals, policies, and programs that offer actions for addressing housing needs within city boundaries. Additionally, Sparks developed *The City of Sparks 2016 Housing Plan,* which is an appendix to the Comprehensive Plan and informed the policies and programs included in the Plan. Some of the policies that promote affordable housing include:

- Ensure there are sufficient appropriately zoned areas with the infrastructure, public facilities, and services necessary for producing new housing.

- Promote a variety of housing types throughout Sparks, including within mixed-used settings, to expand the choices available to meet the financial and lifestyle needs of a diverse population and workforce.

- Ensure a variety of transportation modes are available to all areas of the city, while not solely favoring autos, which will promote a variety of housing types being made available in Sparks.

- Enforce property maintenance ordinances to ensure older areas of the City remain attractive.

- Utilize the incentives provided by the Washoe County Home Consortium to support affordable housing options.

- Facilitate development of multigenerational housing options and products.

- Facilitate housing communities for seniors, including aging-in-place options.

The *Washoe County Master Plan* (2010) identifies goals, policies, programs, and actions to increase affordable and workforce housing, such as:

- Develop programs that allow for more flexibility in the zoning, building, and land use regulations to enable affordable housing units to be built throughout the community.

- Evaluate the imposition of standards and/or techniques that increase the cost of housing. Consider a fee structure that takes the size and location of units into account. Conduct a review of all ordinances that may impede affordable housing development, and consider incorporating mixed-use and village developments to allow for the development of affordable housing.

- Develop a housing rehabilitation program that will be part of the overall revitalization of the Sun Valley community. The housing rehabilitation program could include:

  – Development in partnership with public and private organizations and local community groups.
  – Incentives, such as waiver of annual fees or reduction in permit fees necessary for rehabilitation, to encourage upkeep and rehabilitation of housing by property owners and encourage upgrades to meet minimum energy-efficiency standards.

- Work in cooperation with other local jurisdictions to create a single point of contact that will monitor the inventory of affordable housing in the region and assist local property managers to identify funding sources that will allow them to maintain affordability of a

housing project. The jurisdictions will also impose resale controls or rental restrictions for affordable units built with locally generated housing funds.

- Implement a "no net loss" policy that will provide a framework for Washoe County to ensure continuing availability of affordable housing.

- Grant developers of real property permission to build at a greater density than would otherwise be allowed under the master plan, in exchange for an agreement by the developer to perform certain functions that the governing body determines to be socially desirable, including, without limitation, developing an area to include a certain proportion of affordable housing.

- Develop programs that allow for flexible land use regulation standards and that offer regulatory and/or financial incentives to encourage developers to provide affordable housing units.

- Determine how accessory dwelling units can play a more significant role in providing affordable housing in Washoe County.

- Help developers identify sites for the development of affordable housing.

Other Future Actions

Redevelopment within downtown Reno, where most affordable housing is available, will likely increase rents and home prices as the area becomes more sought after. The Fountain District is a proposed $500 million mixed-use redevelopment project in downtown Reno that spans W Fourth Street from the Sands Regency to the Gold Dust West, generally between West Street and Keystone Avenue. The project includes the demolition of several area motels, which have historically served as *de facto* affordable housing. Throughout the Truckee Meadows region, but mainly in its urban centers, these motels serve as single-room-occupancy housing (single rooms without amenities such as kitchens or private bathrooms) and housing of last resort for low- to very-low-income populations. Jacob Entertainment, the developer for Fountain District, has donated $1.5 million in affordable housing inventory and cash to the Reno Housing Authority (ThisisReno 2017).

A similar redevelopment effort is proposed along Second Street between Washington Street and Arlington Avenue in downtown Reno. Approximately 237 units of apartments and weekly motels will be removed and residents relocated to make way for redevelopment. These residents are likely below the 80 percent of area median income and face a deficit of affordable housing options. Three types of affordable housing are identified as part of the redevelopment plan: subsidized affordable housing, workforce housing made affordable through pricing, and active senior housing. Clark Development's presentation to the City of Reno identified 20 percent of proposed apartments for those earning 80 percent of the region's median income,

and 70 percent of the condominiums are expected to qualify for Nevada Home is Possible program, which offers a down payment grant (*Reno Gazette-Journal* 2016).

Downtown Sparks (Victorian Square) is also undergoing redevelopment to create a vibrant, mixed-use downtown. Along with redevelopment often comes higher rent and housing costs as new residents are attracted to an area and are willing and able to pay more for certain upscale amenities. However, redevelopment thus far has included multifamily units, and more multifamily housing units are planned. In addition, the project has not displaced housing units; most of the redevelopment has taken place on existing commercial lots, parking, and vacant lots.

Other future plans for redevelopment include the University of Nevada, Reno University District, which includes the areas south of I-80 to downtown Reno. Census data indicate that the income of between 40 and 64 percent of residents' in this area is below the federal poverty level. Land uses in the area include Metropolitan Garden Apartments (low-income apartment housing subsidized by U.S. Department of Housing and Urban Development), Reno Events Center, motels, bungalows, casinos, transit center (Greyhound/Amtrak/RTC Fourth Street Station), and vacant lots. No development proposals have been put forth in this area to assess the potential effects on affordable housing.

Resource Management

The TMRPA, Washoe County, and the Cities of Reno and Sparks recognize the need for a more diverse, affordable housing supply and have identified actionable policies and programs in their plans to promote development of affordable housing. As discussed in Section 2.4.1.5, the local jurisdictions and the Truckee Meadows Regional Planning Agency are committed to developing affordable housing to meet the needs of lower-income residents.

3.2.1.2 Environmental Consequences

Supply of Affordable Housing

Economic growth and redevelopment associated with past, ongoing, and future development in the traditional cores of Reno and Sparks may contribute to increasing housing prices, increased displacement of low-income residents, and/or a reduced supply of affordable housing. The Spaghetti Bowl Project would not affect the region's housing supply by contributing to economic and regional growth (population, households, or employment). The Spaghetti Bowl Project would, however, dislocate between 233 and 938 housing units, depending on the alternative (Table 3-7.) Of these housing units, between 2 and 86 housing units are publicly owned, between 15 and 72 are mobile homes, and between 86 and 608 are low- or mid-density multifamily homes (see Appendix D.2, *Community Impacts Assessment Technical Report,* for more information on direct effects). This type of housing is part of the missing middle category of housing. The loss of this type of housing could affect the supply of affordable housing, as the market feasibility of developing this type of housing is much lower than for low-density single-

family residences. Market incentives (profitability) encourage the development of single-family housing (TMRPA 2017).

Table 3-7. Number of Residential Displacements

Alternative	Residential Displacements			
	Single-Family Residential	Mobile Home	Reno Housing Authority (Mineral Manor)	Multifamily Residential
Alternative 1	172	72	86	608
Alternative 2	87	15	42	182
Alternative 3	75	70	2	86
Source: *Spaghetti Bowl Project Community Impacts Assessment Technical Report*.				

Residents displaced by the project would be relocated to comparable housing over NDOT's initial 20-year project implementation horizon as their homes are acquired. As discussed in the *Community Impact Assessment Technical Report,* displaced home owners and renters will be compensated per the Uniform Act. Based on conceptual phasing plans, most displacements would occur prior to construction of the north leg of US 395 (late 2020s) and west leg of I-80 (mid 2030s). The *Truckee Meadows Housing Study* forecasts that population and housing demand will grow more slowly after 2020 than it will in the 2015-2020 period (TMRPA 2017). This should provide the market time to develop more affordable housing per the programs outlined in local plans, and make it easier to absorb these displaced residents into replacement housing they can afford. NDOT will closely monitor the housing market and may take additional steps beyond those required by the Uniform Act to ensure displaced residents are adequately compensated, such as extending the payments of the difference between the current base rent and the actual replacement rent beyond 42 months (see Section 7.0, Measures to Mitigate Impacts, in the *Community Impact Assessment Technical Report*.)

If the Fountain District Development or Second Street Development were to occur concurrently with the Spaghetti Bowl Project, it could intensify the potential impacts on the supply of affordable housing for home-owners and renters earning less than 80 percent of the area median income. The actionable affordable housing policies and programs identified in the Cities of Reno and Sparks plans promote development of affordable housing as an integral element of redevelopment projects.

The project would likely contribute to an adverse cumulative impact on the availability of affordable housing if the Fountain District Development, Second Street Development, and Spaghetti Bowl Project occurred concurrently.

3.2.1.3 Potential Mitigation

Mitigation measures for cumulative impacts on the supply of affordable housing will be delivered in the future when residential relocations are needed for construction. Measures NDOT will implement are discussed below.

The Uniform Act is the cornerstone of NDOT's plan to mitigate the impacts of residential displacements. The Uniform Act stipulates that property owners must receive fair market value for their property and covers renters, too. Per the Uniform Act, NDOT is required to:

- Pay fair market value for homes purchased.
- Provide replacement housing for homeowners. This means no one is required to move from a residence without NDOT offering a comparable replacement.
- For renters, find a comparable replacement rental.
- Treat people who live in publicly owned housing (like Reno Housing Authority's Mineral Manor) similar to market rate renters but with additional protections to not change their monthly rental costs.

Beyond the Uniform Act requirements, NDOT commits to:

- Convening a meeting of Reno Housing Authority, City of Reno, City of Sparks, and Truckee Meadows Regional Planning Agency to discuss the project's impact on affordable housing. The meeting was held December 17, 2018. The goal of the meeting was to put the impacts in context and discuss additional mitigation measures, beyond the required Uniform Act provisions, that could help mitigate the affordable housing impact. At the meeting, the Reno Housing Authority said that it did not have a preference for onsite versus offsite replacement of housing, but that it would depend on the location. They also noted that it is critical to end with the same or greater number of units after displacement occurs.
- Extending rental assistance up to 24 months beyond the Uniform Act-required 42 months (rental assistance for a total of 66 months).
- Providing funds or land already owned by NDOT to others (Cities of Reno or Sparks, Washoe County) to build affordable replacement housing for non-Reno Housing Authority displacements. Those displaced by this project who wish to remain in the area will be given priority access to the replacement housing. After those needs have been addressed this affordable housing will then be made available to those who qualify for affordable housing and have not been displaced by the project. Residents will be considered eligible for this

replacement affordable housing if they meet Section 8[30] eligibility requirements or Reno Housing Authority's Admission and Continued Occupancy Policy[31] (2018). The contribution of funds or lands will be tied to commitments from recipients to have affordable replacement housing available prior to the initiation of the NDOT right-of-way acquisition process.

- Ensuring, to the extent possible, the Reno Housing Authority's federal funding from the Department of Housing and Urban Development will not be reduced because of the Spaghetti Bowl Project. This may be accomplished by providing the Reno Housing Authority with funding to replace the Mineral Manor buildings that would be acquired with an equal number of total units or up to 10 percent more units than the number of units being acquired. NDOT will provide the difference in funds between what the Uniform Act pays and what is required to replace the same number of units or up to 10 percent more units than would be displaced. This measure will be implemented early enough to ensure displaced residents move directly from their current Reno Housing Authority residence into the new Reno Housing Authority replacement housing.

- Providing undeveloped land already owned by NDOT to the Reno Housing Authority for them to build replacement units.

- Providing Reno Housing Authority with funding so the Reno Housing Authority can provide vouchers for up to 24 months for displaced Mineral Manor residents, allowing them to live offsite in existing housing in the event replacement Reno Housing Authority housing isn't immediately available.

- Working with the Reno Housing Authority to complete a feasibility study focused on Mineral Manor. The study will be completed within one year of the issuance of the ROD for the Spaghetti Bowl project and will address the following:

  – Estimate the remaining life in the Mineral Manor buildings under different investment scenarios ranging from routine maintenance only, to major maintenance as needed to maximize building life, and associated cost of each scenario.

[30] Created by the Housing and Community Development Act of 1978, the Housing Choice Voucher program, also known as Section 8, provides assistance to eligible low- and moderate-income families to rent housing in the private market. Eligibility for this program is based on a family's gross annual income and family size.

[31] The Admissions and Continued Occupancy Policy describes the eligibility, continued occupancy and termination policies for RHA's Public Housing program as approved by the Board of Commissioners. It explains the day-to-day operations of the Public Housing Program and includes local policies and procedures.

- Assess parking needs and limitations at the existing and future Reno Housing Authority housing as a result of new traffic patterns and loss of parking because of the project as a whole or by construction phase.
- Explore the feasibility of onsite Reno Housing Authority replacement housing versus potential offsite replacement housing. Assess the number of replacement units needed, related parking requirements, possible zoning changes, pros and cons of ground-level or multistory buildings, and timelines for when housing replacement construction will need to start to prevent impacts to Reno Housing Authority operations and possible loss of subsidies from the Department of Housing and Urban Development.
- Develop in conjunction with nearby residents or neighborhood advisory boards and Cities of Reno and Sparks, potential neighborhood-scale enhancements. The intent of this is to enhance community cohesion in directly affected neighborhoods.

All mitigation commitments are based on 2019 Reno area housing conditions and project area demographics. Because the project will be delivered over 20 years, the identified mitigation measures could be revised to reflect the most current housing and community needs in the future when residential relocations are needed for construction. NDOT will develop a more detailed relocation plan closer to when the displacements occur.

Additionally, other measures are being implemented by the Cities of Reno and Sparks and Washoe County to increase the supply of affordable housing as discussed in Section 3.2.1.1. They will continue to implement the strategies identified in their respective plans that increase affordable housing opportunities.

3.2.2 Fish Impacts – Lahontan Cutthroat Trout and Cui-ui

3.2.2.1 Affected Environment

Resource Condition and Trends – Lahontan Cutthroat Trout

Lahontan cutthroat trout historically occupied a variety of water bodies, including large freshwater and alkaline lakes and small alpine lakes, major rivers such as the Truckee River and tributaries, and small alpine streams in the Lahontan Basin of northern Nevada, eastern California, and southern Oregon. Lahontan cutthroat trout currently occupy approximately 641 stream miles: 588 stream miles in their historical range and 53 stream miles outside their historical range. Five lakes have Lahontan cutthroat trout populations where they occurred historically but only two have self-sustaining populations. Stocking programs maintain all other lake populations, including some outside their historical range (USFWS 2009).

In the Truckee River Basin, Lahontan cutthroat trout occurred historically from California headwaters to Pyramid Lake (USFWS 2009). They currently occupy approximately 111,000 acres of lake habitat and 97 miles of stream habitat (NDOT 2017). Lahontan cutthroat trout were eliminated in Pyramid Lake around 1944, but a stocking program initiated after the 1940s

returned them to the lake (USFWS 1995). Artificial breeding programs maintain Lahontan cutthroat trout in the Truckee River and Lake Pyramid (USFWS 2009).

USFWS curtailed stocking Lahontan cutthroat trout from 2011 through 2015 (Hawks 2017). According to the Nevada Department of Wildlife, the USFWS considers the entire Truckee River below Mogul (7 miles west of Reno) "occupied," because USFWS resumed Lahontan cutthroat trout stocking in 2016 and continued it in 2017 (Hawks 2017 and 2018). Hatchery Lahontan cutthroat trout occur in the Truckee River in the study area, but the native species are not known to be present. Native Lahontan cutthroat trout do not spawn in the study area because Derby Dam (25 miles east of Reno) prevents upstream movement. Natural spawning occurs below Derby Dam and in some California tributaries of the Upper Truckee River (Simpson 2017). Lahontan cutthroat trout also occur in Pyramid Lake, both from hatchery stocking by Tribal hatcheries and from reproduction in the lower Truckee River below Derby Dam (Hottle 2017a). See Figure 3-1B.

One of the leading causes of cutthroat trout population declines in the western United States is habitat fragmentation, which reduces the total habitat available, reduces habitat complexity, and prevents gene flow. Fragmentation has occurred in the Truckee River basin and as a result Lahontan cutthroat trout in Pyramid Lake can no longer migrate into the Upper Truckee River or Lake Tahoe for spawning due to irrigation diversions and other human-made river obstructions (USFWS 2009).

Nonnative fish, especially trout, which compete and hybridize with Lahontan cutthroat trout, are the greatest threat to Lahontan cutthroat trout throughout their range. Introduction of nonnative trout has caused most of the decline, and in places elimination, of the Lahontan cutthroat trout population since the mid-1990s. Brook trout are the predominant competitor with Lahontan cutthroat trout (USFWS 2009). Aquatic invasive species such as Mysis shrimp, New Zealand mud snails, and quagga mussels also threaten Lahontan cutthroat trout recovery. Mysis shrimp have been particularly harmful in lakes in the Lake Tahoe basin. None of these are a problem yet in the study area, but the New Zealand mud snails in the Truckee River could become more of a threat (USFWS 2009; Crookshanks 2014).

Resource Condition and Trends – Cui-ui

Cui-ui only occur in the action area from Pyramid Lake to Derby Dam on the Truckee River and in Pyramid Lake. There are no fish passage facilities at Derby Dam to allow spawning migrations of cui-ui to pass west from that point.

Upstream storage of water and diversion of water from the Truckee River reduces inflow to Pyramid Lake and has contributed to the decline of the cui-ui population. Timber harvesting and irrigated agriculture in the basin during the 1800s altered water runoff quantity and quality into the Truckee River. However, the largest diversion of Truckee River water occurred in 1905

with the completion of Derby Dam, a key feature of the Newlands Project. Increasing water demands from industry, agriculture, and municipalities further altered the volume and timing of river flows. In combination, these factors disrupt cui-ui reproduction (USFWS 1992).

Other Future Actions

Projects that have the potential to affect the Lahontan cutthroat trout and cui-ui are summarized below. The present and future projects discussed below are like this project in that they could have short-term construction impacts on the Lahontan cutthroat trout and cui-ui, but they would have long-term advantages.

Truckee River Flood Management Project. The Truckee River Flood Management Authority is implementing the Truckee River Flood Management Project to reduce flood damage. Recreational and ecosystem restoration features will be incorporated in the footprint of the flood protection infrastructure. Environmental enhancement elements include the following:

- Replacing bridges to increase Truckee River channel capacity
- Excavating floodplain terraces to improve floodwater storage
- Restoring ecosystem functions and creating habitat for native species

About 7.6 miles of the Truckee River channel has already been restored.

USFWS Fish Passage Projects. The USFWS is planning several fish passage projects at several dams that currently block fish movement (Hottle 2017b). The projects would improve Lahontan cutthroat trout and cui-ui movement into the study area and beyond. Four dams blocking fish passage will be rehabilitated from 2018 through 2022 through the Truckee River Fish Passage Project, which is a joint effort between the USFWS and the Truckee Meadows Water Authority:

- Steamboat Ditch Diversion near Verdi, Nevada, upstream of the study area (planned for 2018, now postponed)
- Verdi Power Dam (2019)
- Washoe Highlands Dam (2021)
- Fleisch Diversion Dam (2022)

The Derby Dam, downstream of Reno and Sparks, will also be rehabilitated in the next several years (Hottle 2017a). See Figure 3-1B.

Resource Management

To address threats to Truckee River and Pyramid Lake Lahontan cutthroat trout, the USFWS developed a Lahontan Cutthroat Trout Recovery Plan in 1995. The plan identified habitat fragmentation as one of four major threats to the species. It recommended that the long-range options for water and other uses in the Truckee River basin should be determined by developing a Truckee River basin ecosystem plan.

Another important recovery effort under way is to improve Lahontan cutthroat trout movement in the Truckee River through construction of fish passage at the dams mentioned above. The Derby Dam will also be rehabilitated in the next several years (Hottle 2017a).

There have been two recovery plans for the cui-ui, with the most recent completed in 1992 (USFWS 1992). The ultimate objective of the plan is to allow the cui-ui to be removed from the endangered species list.

3.2.2.2 Environmental Consequences

The project's adverse impacts on the Lahontan cutthroat trout would be short-term construction impacts. The most notable short-term impact on the Lahontan cutthroat trout would occur in the dewatered area upstream and downstream of the I-580 bridge pier that NDOT is proposing to remove from the Truckee River. NDOT would dewater the area surrounding the I-580 bridge pier for a three-month period. As this area is dewatered, trout that are unable to swim through the dewatered area would be hand-removed by a biologist. FHWA, in consultation with USFWS, determined that handling cutthroat trout may result in harm, harassment, and potentially mortality (although this is not anticipated).

The project's potential beneficial impact to the Lahontan cutthroat trout would be to improve Truckee River water quality by building stormwater treatment detention basins. The detention basins would treat stormwater runoff from the freeway before it enters the river.

As noted, the similarity between this project and the others is that there are short-term construction impacts that could affect the Lahontan cutthroat trout and long-term beneficial impacts.

The in-water work proposed with this project and the others would reduce Truckee River habitat accessible to the Lahontan cutthroat trout during construction. Given the small area of the dewatered areas relative to the amount of habitat available in the Truckee River, the cumulative impacts from a temporary loss of river habitat are expected to be minimal. In addition, the sediment that may be stirred up or added to the river during in-water work for this project would temporarily reduce visibility and possibly increase water temperature, both of which could adversely affect the Lahontan cutthroat trout. The best management practices to prevent erosion would minimize the amount of sediment entering the river and its impact on the Lahontan cutthroat trout.

If a fish passage project(s) is completed that would allow the cui-ui to enter the study area before the in-water work associated with the Spaghetti Bowl construction, it could expose the cui-ui to some of the same short-term impacts as the Lahontan cutthroat trout. Because NDOT would not conduct any in-water work in April and May, the cui-ui would not be exposed to potential impacts associated with dewatered areas.

In summary, this project would contribute to cumulative short-term impacts, the most serious of which could be mortality of Lahontan cutthroat trout during dewatering and fish salvage activities. As noted, the impact would be minimized by mitigation measures NDOT would implement to protect the Lahontan cutthroat trout that have to be handled. In September 2018, the USFWS approved the impact avoidance and minimization strategies for the Lahontan cutthroat trout.

This project also would contribute positively to the cumulative long-term benefits of the projects discussed above. This project's potential beneficial impact to the Lahontan cutthroat trout is the improvement in Truckee River water quality caused by the proposed detention ponds. The ponds would treat stormwater runoff from the freeway before it enters the river.

The fish passage improvement projects would allow native Lahontan cutthroat trout to enter the study area through migration from upstream or downstream native populations. There would be similar benefits for the cui-ui, which currently only occur in the Truckee River between Pyramid Lake and the Derby Dam. There are no fish passage facilities at Derby Dam that would allow spawning migrations of cui-ui to pass west from that point. The ability of the Lahontan cutthroat trout and cui-ui to expand their ranges has the potential to reverse the habitat fragmentation both species have experienced. The USFWS's *Lahontan Cutthroat Trout Recovery Plan* identified habitat fragmentation as one of four major threats to the species (USFWS 1995).

Improvements to the habitat adjacent to the Truckee River from the Truckee River Flood Management Project may have water quality benefits for the river that could benefit the Lahontan cutthroat trout. In the balance, the positive cumulative impacts of the projects discussed in this subsection outweigh the short-term adverse impacts.

3.2.2.3 Potential Mitigation

The mitigation measures to address this project's potential short-term impacts to the Lahontan cutthroat trout are discussed in Section 3.9, Vegetation, Wildlife, and Fish, of the Final EIS. NDOT will implement the measures the U.S. Fish and Wildlife Service identified in its September 2018 Biological Opinion for the Lahontan cutthroat trout (Appendix D.10). NDOT is not proposing other mitigation measures for potential cumulative impacts because the long-term impacts of this project and others described above are expected to have a positive impact on the Lahontan cutthroat trout and the cui-ui.

3.3 SUMMARY

The Spaghetti Bowl Project would likely contribute to an adverse cumulative impact on the availability of affordable housing if the Fountain District Development, Second Street Development, and this project were constructed concurrently. This impact would be mitigated

through actions undertaken by NDOT and the affordable housing policies, programs, and strategies being implemented by Washoe County and the Cities of Reno and Sparks.

The project also would contribute to cumulative short-term impacts on the Lahontan cutthroat trout, the most serious of which could be mortality of Lahontan cutthroat trout during dewatering and fish salvage activities. This impact would be mitigated by the measures discussed above, and in Section 3.9, Vegetation, Wildlife, and Fish, of the Final EIS. This project also would contribute positively to the cumulative long-term benefits for the Lahontan cutthroat trout and cui-ci. This project's potential beneficial impact to the Lahontan cutthroat trout is the improvement in Truckee River water quality resulting from the proposed detention ponds.

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Attachment 1 Scoping Comments for I-90/I-580/US 395 Spaghetti Bowl Interchange Project

RENO-SPARKS INDIAN COLONY

CHAIRMAN'S OFFICE

34 Reservation Road, Reno, NV 89502

Phone: (775) 329-2936 • Fax: (775) 954-9175

April 28, 2017

Nick Johnson
Project Manager
Nevada Department of Transportation
1263 South Carson Street
Carson City, NV 89712

Subject: Reno Spaghetti Bowl Project Agency Scoping Comments

Dear Mr. Johnson,

Thank You for the opportunity for the Reno-Sparks Indian Colony (RSIC) to provide the following agency scoping comments for the Environmental Impact Statement (EIS) for the Reno Spaghetti Bowl Project. As a cooperating agency, the RSIC is pleased to work with the Federal Highways Administration and the Nevada Department of Transportation to carefully examine any and all direct & indirect impacts the proposed project may have on the Colony and its members.

Transportation Access

- For over 100 years the Reno-Sparks Indian Colony has worked to improve the quality of life for its Tribal Members and to develop a self-sufficient economy.
- Tribal Members rely on the East 2nd St/Glendale Ave interchange to access their homes and to obtain Government and health care services.
- A closure or change in access onto the East 2nd St/Glendale Ave interchange and into the existing Spaghetti Bowl system could negatively impact Tribal Members ability access to areas off the reservation for employment and personal needs.
- Closure of the East 2nd St/Glendale Ave interchange would increase traffic on Mill Street and negatively impact egress from Golden Lane and Reservation Road onto east bound Mill Street and the I-580 freeway system.
- A closure of the East 2nd St/Glendale Ave interchange would also increase north-south traffic on Golden Lane and Reservation Road through established neighborhoods and Colony educational & government facilities.

Health Care

- Reno-Sparks Indian Colony Tribal Members and nearly 9,000 American Indian & Alaskan Natives living within the Truckee Meadows area rely on the East 2nd St/Glendale Ave interchange to access health care services at the Reno-Sparks Tribal Health Center. In 2016, the center recorded over 50,000 patient visits and has a staff of 110.
- Maintaining existing or improving access to the Reno-Sparks Tribal Health Center is critical for the Truckee Meadows. Under the terms of a 2016 Memorandum of Understanding signed between the Reno-Sparks Indian Colony and the Washoe County Health District, the health center has been designated as a point of dispensing of prophylaxis medications during public health emergencies in the region.

Economic Development

- Working with its regional partners the Reno-Sparks Indian Colony has invested millions of dollars to redevelop and improve former blighted properties near the current Spaghetti Bowl that have helped advance local government plans & development goals, and Federal policies towards Tribes.
- The East 2nd St/Glendale Ave interchange and Mill Street interchange provide critical access for customers visiting Tribal Enterprises and businesses located on Tribal land. Any temporary disruption of access to these Tribal Enterprises and businesses during construction activities will negatively impact tribal government revenues. Any permanent change to or disruption of access due to interchange reconfiguration could have a significant, long-term, negative impact on Tribal Government revenues and will result in a loss of Tribal Member employment opportunities and Tribal Government services.

Cultural Resources

- The Truckee River is an important cultural resource for the members of the Reno-Sparks Indian Colony who are comprised of Paiute, Washoe and Shoshone ancestry. It is important that any future change to the configuration of the Spaghetti Bowl system does not negatively impact the Truckee River as a cultural resource to Tribal Members.
- The building that houses Tribal Historic Preservation Office for the Reno-Sparks Indian Colony located at 1995 East 2nd. Street is listed on the National Register of Historic Place. Historically known as the "The Stone Building" this historic structure was constructed in 1926 using the distinctive "Stewart Vernacular" architectural style and is the oldest building associated with the Reno-Sparks Indian Colony.

Community Impacts

- Tribal Member homes are located near the existing freeway and most homes are over 50 years old. The EIS process should carefully analyze any potential noise, sound, air quality, historical integrity, visual and community impacts that the Spaghetti Bowl project could have on these existing neighborhoods.

- Reno-Sparks Indian Colony Tribal Members and other low income residents living within urban Reno-Sparks near the Spaghetti Bowl rely on the Walmart Supercenter on East 2nd St for access to groceries and other essential services. Any action from the proposed project that would cause this store to close would create a UDSA "low access community" or food island within this portion of the Truckee Meadows.

Public Safety

- The Reno-Sparks Indian Colony Tribal Police Department uses the East 2nd St/Glendale Ave interchange to respond to emergency calls on the Colony from the Hungry Valley Community and vice versa. A permanent closure or change in access to this interchange could negatively impact law enforcement's ability to adequately respond to emergencies in both Tribal communities.

If you have any questions or need any additional information about the RSIC's comments, the lead staff contact is Scott Nebesky, Planning Director (775-785-1363; snebesky@rsic.org).

Sincerely,

Arlan D. Melendez
Tribal Chairman

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

April 12, 2017

Abdelmoez A. Abdalla
Environmental Program Manager
Federal Highway Administration
705 N. Plaza, Suite 220
Carson City, NV 89701

Subject: Scoping Comments for the Environmental Impact Statement for the I-80/I-580/US 395 Spaghetti Bowl Interchange Project, Washoe County, Nevada

Dear Mr. Abdalla:

The U.S. Environmental Protection Agency (EPA) has reviewed the Federal Register Notice published on March 15, 2017, requesting comments on the Federal Highway Administration (FHWA) decision to prepare a Draft Environmental Impact Statement (DEIS) for the I-80/I-580/US 395 Spaghetti Bowl Interchange Project. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508) and Section 309 of the Clean Air Act.

We also accept the invitation from FHWA and the Nevada Department of Transportation (NDOT), sent by Nicholas Johnson of NDOT on March 22, to become a "Participating Agency" (as defined in 23 USC 139). We look forward to working with FHWA and NDOT to ensure that early coordination procedures assist both our agencies in meeting our statutory missions.

As a Participating Agency, we define EPA's role in the development of the project to include the following as they relate to our jurisdiction by law or areas of expertise:

1) Provide meaningful and early input on defining purpose and need, determining the range of alternatives to be considered, and the methodologies and level of detail required in alternatives analysis.
2) Participate in coordination meetings and joint field reviews as appropriate and as resources allow.
3) Review and comment on the pre-draft or pre-final environmental documents (including technical reports and/or plans related to traffic analysis, air quality, wetlands/waters, biological resources, cumulative impacts assessment, and conceptual mitigation) as resources allow to reflect the views and concerns of EPA on the adequacy of the documents, alternatives considered, anticipated impacts, and avoidance, minimization, and mitigation strategies.

EPA reviewed the Draft Agency Coordination Plan and Draft Impact Assessment Methodologies that were sent with the invitation to be a Participating Agency. We have two comments on the Impact Assessment Methodologies, beyond what is included in our enclosed scoping comments:

1. In the section on Water Resources Impact Methodology, we recommend that you include EPA, in addition to the Army Corps of Engineers, as an agency with which to coordinate on issues of impacts to wetlands and water resources.
2. In the section on Air Quality Impact Methodology, include information on when you plan to do Interagency Consultation on the determination of whether the project is a Project of Air Quality Concern, for example, if you plan to do that in one of the regular Washoe Regional Transportation Commission Air Quality Interagency Consultation Group Meetings.

EPA appreciates the opportunity to comment on preparation of the DEIS. Once the DEIS is released for public review, please send one hard copy and one electronic copy to me at the address above (mail code: CED-2). If you have any questions, please feel free to contact me at (415) 947-3554 or mulvihill.carolyn@epa.gov.

Sincerely,

Carolyn Mulvihill

Carolyn Mulvihill
Environmental Review Section

Enclosures: EPA's Detailed Comments

cc: Steve Cooke, Nevada Department of Transportation

EPA SCOPING COMMENTS ON THE I-80/I-580/US 395 SPAGHETTI BOWL INTERCHANGE PROJECT, WASHOE COUNTY, NEVADA, APRIL 12, 2017

Range of Alternatives

The DEIS should examine a full range of alternatives to meet the purpose and need for the project. Specifically, EPA recommends that the DEIS consider an alternative or group of alternatives that maximizes the use of existing facilities, including features such as congestion pricing, high occupancy toll lanes, and improved transit services.

Air Quality

EPA recommends that the DEIS discuss the potential air quality impacts of this project, resulting from both potential construction activities and operation. Washoe County is a federally designated maintenance area for particulate matter smaller than 10 microns (PM_{10}) and carbon monoxide (CO). Because of the area's maintenance status, it is important to reduce emissions of CO and particulate matter from this project to the maximum extent. Also, since the project area is in a maintenance area, transportation conformity applies, so a PM_{10} project level conformity analysis is needed if the project is deemed a Project of Air Quality Concern and a CO hot spot analysis is required.

Recommendations:

- Provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), and criteria pollutant maintenance areas.
- Include a thorough analysis of impacts (including cumulative and indirect impacts) from the construction and operation of the proposed alternatives. Include monitoring data, any anticipated exceedances of NAAQS, and estimates of all criteria pollutant emissions.
- Discuss potential air quality impacts in the context of conformity requirements and associated state implementation plans. The DEIS should demonstrate that the project is included in a conforming transportation plan and a transportation improvement program and that the emissions from both the construction and the operational phases of the project conform to the applicable State Implementation Plans, if appropriate, and do not cause or contribute to violations of the NAAQS.
- Disclose available information about the health risks associated with emissions, sensitive receptors in the vicinity of the project area, and how the proposed project will affect current emission levels. Include information about current emissions along with anticipated emissions at interim and full build phases of the proposed improvements.
- Describe specific commitments to mitigate emissions that will prevent degradation of air quality and reduce health impacts. Include an estimate of the air quality benefits and reduced health effects that result from each mitigation measure proposed in the DEIS. Identify any specific mitigation measures considered for sensitive populations (including schools, daycare facilities, hospitals, elderly care facilities, etc.).

Construction Emissions

EPA recommends that the DEIS and Record of Decision include a Construction Emissions Mitigation Plan for fugitive dust and diesel particulate matter (DPM). Please consider the following best available control measures (BACM) for all pollutants when preparing the Construction Emissions Mitigation Plan.

Fugitive Dust Source Controls:

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate. Operate water trucks or consider other options for stabilization of soil and disturbed surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Mobile and Stationary Source Controls:

- Reduce use, trips, and unnecessary idling from heavy equipment.
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, where applicable, and to perform at verified standards applicable to retrofit technologies. Employ periodic, unscheduled inspections to limit unnecessary idling and to ensure that construction equipment is properly maintained, tuned, and modified consistent with established specifications.
- Prohibit any tampering with engines and require continuing adherence to manufacturer's recommendations.
- If practicable, lease new equipment meeting the most stringent of applicable federal standards, commit to using the best available emissions control technologies on all equipment, and where appropriate use alternative fuels such as natural gas and electric.
- Utilize EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of DPM and other pollutants.

Administrative controls:

- Coordinate with appropriate air quality agencies to identify a construction schedule to minimize cumulative impacts from multiple development and construction projects in the region, if feasible, to minimize cumulative impacts.
- Identify all commitments to reduce construction emissions and update the air quality analysis to reflect additional air quality improvements that would result from adopting specific air quality measures.
- Identify where implementation of mitigation measures is rejected based on economic infeasibility.
- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking. (Suitability of control devices is based on: whether there is reduced normal availability of the construction equipment due to increased downtime and/or power output, whether there may be significant damage caused to the construction equipment engine, or whether there may be a significant risk to nearby workers or the public.)
- Develop a construction traffic and parking management plan that minimizes traffic interference and maintains traffic flow.
- Identify sensitive receptors in the project area, such as children, elderly, schools, and hospitals, and specify the means by which you will minimize impacts to these populations. For example, locating construction equipment and staging zones away from sensitive receptors and fresh air intakes to buildings and air conditioners.

Mobile Source Air Toxics

Given the highly developed nature of the project area and the existence of both residential and commercial property adjacent to the corridor, it is likely that there are sensitive receptors close enough to the roadway to experience MSAT impacts. Many studies have measured elevated concentrations of pollutants emitted directly by motor vehicles near large roadways. These elevated concentrations generally occur within approximately 200 meters of the road, although the distance may vary depending on traffic and environmental conditions. A large number of recent studies have examined the association between living near major roads and various adverse health endpoints. Several well-conducted epidemiologic studies have shown associations with cardiovascular effects, premature adult mortality, and adverse birth outcomes, including low birth weight and size. Traffic-related pollutants have been repeatedly associated with increased prevalence of asthma-related respiratory symptoms in children. For a thorough review of near-roadway monitoring studies, see Section 3.1.3 of EPA's *Regulatory Impact Analysis: Control of Hazardous Air Pollutants from Mobile Sources.*[1]

The March 2007 report entitled *Analyzing, Documenting, and Communicating the Impacts of Mobile Source Air Toxic Emissions in the NEPA Process* conducted for the American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on the Environment and funded by the Transportation Research Board[2] describes the following levels of analysis for consideration in MSAT analyses: qualitative discussion; quantify emissions; toxicity-weight emissions; dispersion modeling; and risk assessment. Procedures for toxicity-weighting, which EPA has found to be especially useful for the targeting of mitigation, are described in EPA's *Air Toxics Risk Assessment Reference Library* (Volume 3, Appendix B, beginning on page B-4).[3] Our recommendations and those included in the AASHTO report, provide further analysis options to supplement the 2016 FHWA *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents.*

Given the growing body of evidence supporting our understanding of the possible adverse health effects associated with living and working near roadways, we recommend that FHWA and NDOT perform an analysis of potential MSAT impacts to determine potential localized impacts to sensitive receptors, and to inform decisionmaking regarding project design and avoidance, minimization, and mitigation options.

Recommendations:

- Include an analysis of potential MSAT impacts in the DEIS to inform decisionmaking regarding project design, and to inform avoidance, minimization, and mitigation options. EPA recommends including the following in the DEIS:
    (1) A map indicating the location of residences and sensitive receptors in close proximity to the project (for example, within 1,000 feet);
    (2) Analysis of MSAT emissions to determine potential exposure for the identified residences and sensitive receptors; and
    (3) Specific mitigation measures or design changes for any impacts to each sensitive receptor location identified.
- Consider a combination of the following methods, depending upon the factors discussed above: qualitative discussion, quantification of emissions, toxicity-weight emissions, dispersion modeling, and risk assessment.

[1] http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2005-0036-1168

[2] http://onlinepubs.trb.org/onlinepubs/archive/NotesDocs/25-25(18)_FR.pdf

[3] https://www.epa.gov/fera/risk-assessment-and-modeling-air-toxics-risk-assessment-reference-library

Children's Environmental Health

Executive Order 13045 on Children's Health and Safety directs each Federal agency, to the extent permitted by law, to make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, and to ensure that its policies, programs, activities, and standards address these risks. Analysis and disclosure of these potential effects under NEPA is necessary because some physiological and behavioral traits of children render them more susceptible and vulnerable than adults to environmental health and safety risks. The DEIS should describe the potential direct, indirect, and cumulative impacts of the project on children's health. Because children spend an average of 35% of their time at schools, EPA recommends consideration of school-related mitigation measures, in addition to other mitigation measures that may reduce impacts to children.

Recommendations:

- Include in the DEIS a discussion of the potential direct, indirect, and cumulative project impacts on children's health. Please consider the following for this discussion:
    - Information on childhood asthma rates and other relevant health data if available;
    - Potential respiratory impacts, including asthma, from construction activities and increased traffic flow;
    - Potential noise impacts to health and learning, especially near schools, homes, and childcare centers.
    - Sensitive receptors should include public schools, private schools, charter schools, preschools, community centers, and childcare centers.
- EPA recommends that FHWA and NDOT consider as a mitigation measure engaging schools most impacted by the proposed project in outreach around EPA's *Best Practices for Reducing Near-Roadway Exposure at Schools* guidance document[4] and the *Tools for Schools* Indoor Air Quality program[5]. The recommendations for schools seeking to reduce students' exposure could be tiered to fit budgets of varying sizes.
    - Factors to consider in prioritization include whether a school is within 500ft of the roadway expansion, whether sound walls or vegetative barriers are present, ability of the school's HVAC system to filter out pollutants and the number of students on free or reduced lunch. The installation of high performance air filtration systems in classrooms has been shown to reduce concentrations of black carbon and $PM_{2.5}$ by up to 96%[6]. This mitigation measure should be shared with schools concerned about near-roadway pollution impacts.
    - Consider the potential for trees to reduce near-roadway air pollution when selecting trees for mitigation or replacement. EPA's *Best Practices for Reducing Near-Road Pollution Exposure at Schools* provides some initial guidance on choosing vegetation to maximize reduction of near-roadway air pollution, and EPA would be happy to engage in discussions with FHWA and NDOT staff to provide additional guidance on this topic.

Environmental Justice

Executive Order 12898 addresses Environmental Justice in minority and low-income populations, and the Council on Environmental Quality (CEQ) has developed guidance concerning how to address Environmental Justice in the environmental review process[7]. The recently released *Promising Practices for Environmental Justice Methodologies in NEPA Reviews* (March 2016) is a compilation of methodologies from current agency practices identified by the NEPA Committee of the Federal

[4] https://www.epa.gov/schools/best-practices-reducing-near-road-air-pollution-exposure-schools
[5] https://www.epa.gov/iaq-schools
[6] Polidori, A. (2013) Pilot study of high-performance air filtration for classroom applications, Indoor Air; 23: 185-195.
[7] http://ceq.hss.doe.gov/nepa/regs/ej/justice.pdf)

Interagency Working Group on Environmental Justice. The document focuses on the interface of environmental justice considerations through NEPA processes and provides recommendations on applying environmental justice methodologies that have been established in federal NEPA practice.

Recommendations:

- Consider *Promising Practices for EJ Methodologies in NEPA Reviews* when developing the EJ section of the DEIS.
- Include a description of the area of potential impact used for the environmental justice impact analysis and provide the source of demographic information.
- Define potential environmental justice concerns, including any environmental justice issues raised during scoping meetings. Discuss the key issues where environmental justice is potentially a concern, such as relocation, air quality, noise, vibration, access to property, pedestrian safety, etc.
- Define the "reference community" and the "affected community." The definitions of each are used to analyze whether there are disproportionately high and adverse human health or environmental impacts by comparing the impacts to the affected community with the impacts to the reference community.
- Disclose whether the project will result in a disproportionate and adverse impact on minority or low-income populations. Ensure this conclusion is reported consistently throughout the DEIS. This statement should be supported by sufficient information for the public to understand the rationale for the conclusion.
- Propose appropriate mitigation if disproportionately high and adverse impacts on minority or low-income populations are likely to result from the proposed action and any alternatives.

Water and Wetlands Resources

The proposed project may involve impacts to water bodies and wetlands. Potential impacts may be direct, from construction and use of the facility, or indirect and cumulative. The assessment of impacts to waters should be of an appropriate scope and detail to identify sensitive areas or aquatic systems with functions highly susceptible to change. EPA recommends that the following information be included in the DEIS for the assessment of existing conditions and environmental consequences of each proposed alternative.

Recommendations:

- Include a classification of waters and the geographic extent of waters and any adjacent riparian areas in the project area.
- Characterize the functional condition of waters and any adjacent riparian areas.
- Describe the extent and nature of stream channel alteration, riverine corridor continuity, and buffered tributaries.
- Identify all protected resources with special designations and all special aquatic sites[8] and waters within state, local, and federal protected lands. Additional steps should be taken to avoid and minimize impacts to these areas.
- Include wildlife species that could reasonably be expected to use waters or associated riparian habitat and sensitive plant taxa that are associated with waters or associated riparian habitat.
- Characterize the hydrologic linkage to any impaired water bodies and identify any Clean Water Act 303(d) listed impaired water bodies that exist in the project area.
- Address potential direct and indirect, or secondary, impacts and identify specifically how each of the following impacts will be minimized or avoided:

[8] Special aquatic sites are defined at 40 CFR 230.40 – 230.45 and include wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes.

- changes in hydrology and sediment transport capacity;
- increases in impervious surfaces and the corresponding increases in the volume and velocity of polluted stormwater;
- decreases in water quality from the impairment of floodplain and ecosystem functions including water filtration, groundwater recharge, and flood attenuation;
- disruption of hydrological and ecological connectivity; and
- decreases in biodiversity and ecosystem stability.

On-site Avoidance and Minimization Strategies

Explore on-site alternatives to avoid or minimize impacts to waters. Typically, transportation projects can accomplish this by: (1) using spanned crossings, arch crossings, or oversized buried box culverts over drainages to encourage continuity of sediment transport and hydrological processes, and wildlife passage; (2) moving alignments to avoid impacts to wetlands and waterways; and (3) establishing and maintaining adequate buffers away from aquatic resources.

Impacts to Clean Water Act Section 404 Waters

In describing existing conditions in the study area, include identification and quantification of jurisdictional waters of the United States (waters of the U.S.) within the study area, including an overview of their condition and current threats to their ecological health. Discharges of dredged or fill material into waters of the U.S. require authorization by the U.S. Army Corps of Engineers under Clean Water Act (CWA) Section 404. If a CWA Section 404 Individual Permit is required, EPA recommends coordination with Army Corps of Engineers and EPA through the *NEPA/Clean Water Act Section 404 Integration Process for Surface Transportation Projects Memorandum of Understanding (NEPA/404 MOU)*. A fully integrated DEIS that adequately addresses these criteria would facilitate the CWA Section 404 permit review process and would reduce the overall time for project implementation by synchronizing NEPA and CWA. The Federal Guidelines at 40 CFR Part 230 promulgated under CWA Section 404 (b)(1) provide substantive environmental criteria that must be met to permit discharges into waters of the United States. These criteria require a permitted discharge to: (1) be the least environmentally damaging practicable alternative (LEDPA); (2) avoid causing or contributing to a violation of a state water quality standard; (3) avoid jeopardizing a federally listed species or adversely modifying designated critical habitat for a federally listed species; (4) avoid causing or contributing to significant degradation of the waters of the United States; and require (5) mitigation for unavoidable impacts to waters.

Stormwater

The stormwater National Pollutant Discharge Elimination System (NPDES) permit program requires certain municipalities to develop and implement a program to protect local waterways by reducing the amount of pollutants that stormwater runoff and melting snow pick up and carry into storm sewer systems. NDOT is authorized under a NPDES permit to discharge stormwater to waters of the U.S. through the municipal separate storm sewer system (MS4) provided it complies with all provisions of the permit. The NPDES permit requires NDOT to implement controls to minimize the discharge of pollutants during construction and to implement controls to minimize discharge from areas of new development or redevelopment through various practices, including the use of infiltration or other low-impact design practices.

On July 28, 2016, The U.S. Department of Justice (DOJ), EPA, and the Nevada Department of Environmental Protection (NDEP) reached an agreement with NDOT to resolve alleged violations of NDOT's stormwater permit. All stormwater management activities related to this project should be consistent with the terms of that agreement.

Recommendations:

- The DEIS should address techniques proposed for minimizing the discharge of pollutants to surface water from construction activities and as well as from the increase in impervious surfaces, consistent with the NPDES permit. Where the proposed project will widen existing roads, realign existing roads, and build new interchanges, FHWA and NDOT should implement new structures or redesign existing structures to ensure that they are effective in reducing the discharge of pollutants.
- The DEIS should briefly discuss the July 28, 2016 settlement between DOJ, EPA, NDEP, and NDOT and how the stormwater management activities related to this project will comply with that settlement.

Cumulative Impact Analysis

Cumulative impacts are defined in CEQ's NEPA regulations as the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such actions (40 CFR 1508.7). These actions include both transportation and non-transportation activities, such as large-scale developments and approved urban planning projects that are reasonably foreseeable and are identified within city and county planning documents. These types of projects, identified within and around the project corridor, should be included in the cumulative impacts analysis.

The cumulative impact analysis for the project provides an opportunity to identify potential large, landscape-level regional impacts, as well as potential large-scale mitigation measures. EPA recommends that the DEIS identify landscape-level impacts to all sensitive resources on a regional scale and guide potential avoidance and minimization measures, while focusing design and mitigation efforts.

Recommendations:

- Conduct a thorough cumulative impact assessment, including a complete list of reasonably foreseeable actions, including non-transportation projects. EPA recommends use of Caltrans' cumulative impacts guidance at http://www.dot.ca.gov/ser/cumulative_guidance/purpose.htm. The guidance is relevant to highway projects outside of California.
- For each resource analyzed:
    - Identify the current condition of the resource as a measure of past impacts. For example, the percentage of wetlands lost to date.
    - Identify the trend in the condition of the resource as a measure of present impacts. For example, the health of the resource is improving, declining, or stasis.
    - Identify the future condition of the resource based on an analysis of the cumulative impacts of reasonably foreseeable projects or actions added to existing conditions and current trends.
    - Assess with specific measures, the contribution of the impact from each alternative to the long term health of the resource.
    - Disclose the parties that would be responsible for avoiding, minimizing, and mitigating those adverse impacts.
    - Identify landscape-level opportunities to avoid and minimize impacts, including working with other entities.

Growth-Related Impacts

The project has the potential to result in indirect impacts (40 CFR Part 1508.8(b)) due to improved access that may induce growth on surrounding lands. The May 2006 *Guidance for Preparers of Growth-*

related, Indirect Impact Analyses[9] (Guidance) developed jointly by Caltrans, FHWA, and EPA, provides an approach to developing a growth-related impact analysis. The Guidance is relevant to highway projects outside of California. After the potential for growth is identified for each alternative, the Guidance recommends assessing if growth-related impacts affect resources of concern.

***Recommendations*:**

- Identify if the project will affect the location and/or timing of planned growth in the area. Specifically, the analysis should identify the potential resources that may be affected by the increased "zone of influence" associated with interchanges and impacts on resources outside of the right-of-way.
- Identify the types of resources that are likely to occur in geographic areas that may be affected by growth. If it is determined that there will be no or insignificant impacts to resources of concern, then document the process and report the results. EPA recommends following the Step-by-Step Approach for Conducting the Analysis in Chapter 6 of the Guidance.
- Include a discussion of mitigation strategies to reduce impacts if adverse impacts cannot be avoided or minimized. Section 6.3 Mitigation of the Guidance provides an approach to address mitigation for growth-related impacts.

[9] http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/gri_guidance.htm

Attachment 2 Expert Panel Meeting Minutes

Reno Spaghetti Bowl

ATTENDEES:	Claudia Hanson, City of Reno	Jill Kramer, CH2M
	Franklin Peralta, City of Reno	
PREPARED BY:	Jill Kramer	
DATE:	December 8, 2017	

The project team is conducting an analysis of whether indirect impacts are likely as a result of the Reno Spaghetti Bowl Project. On December 7, 2017, Jill Kramer of the project team met with Claudia Hanson, Planning Manager, Community Development, and Franklin Peralta, Associate Civil Engineer, Community Development, with the City of Reno. The purpose of the meeting was to gain local insight into the potential for growth in the project study area, both with and without the Reno Spaghetti Bowl, as well as strategies for managing growth in the study area.

The project team presented two exhibits showing the initial Primary and Secondary Area of Potential Effects (APE). The exhibits can be found at the end of these minutes. The APE was developed consistent with guidance documents. The Primary APE is closest to the project and identifies the locations that have the greatest likelihood for indirect effects. It encompasses the social, historic and natural resources that are most directly served by the freeway and its interchanges, and this area may be most susceptible to changes in access. Also, the Primary APE includes the social, historic and natural resources that could be indirectly affected by the encroachment of infrastructure. The Secondary APE illustrates the areas to be evaluated for intraregional land use trends that may be influenced by the project. The Secondary APE largely mirrors the Truckee Meadows Service Area.

Following is a summary of the key points made during the meeting.

- Fire Station #21 is located at 2501 Mill Street, adjacent to I-580. The fire department needs full access to I-580 from Mill Street.
- Renown Regional Medical Center (regional hospital) is located at 1155 Mill St; emergency services need full access at I-580 to Mill Street to access the regional hospital.
- Butler Ranch is now called Daybreak. It is a planned unit development (PUD) south of the airport. The Truckee Meadows Regional Planning Agency can provide the number of units planned at this development.
- Add the Southeast Connector to the maps.
- The City Council is very interested in the proposed StoneGate Development; some council members have indicated that the approval of the StoneGate Development is conditional upon implementation of the Reno Spaghetti Bowl Project. At present, StoneGate Development is not funded.
- The land between the Reno-Sparks Indian Colony and I-580 on the west side of I-580 between Glendale Avenue/E 2nd Street and Mill Street is very hard to develop.
- Evans Park, north of I-80 and across from the University of Nevada, Reno, is a City owned park. The park has deed restrictions that prohibit use of this park.

- Governors Bowl Park adjacent to the WB I-80 ramp to I-580 is owned by the state and leased to the City.
- North of Oddie Blvd and adjacent to US 395, there is a high concentration of affordable housing. Affordable housing is a very important issue for the City and the public. The City recommends that the project team have affordable housing issues resolved before going to the public.
- The Regional Public Safety Training Center is located off Parr Blvd. If the service interchange is improved at Parr Blvd., the undersize roundabout adjacent to the ramp terminus should be corrected with the service interchange.
- As part of the construction of the eastbound on ramp at Keystone Avenue, 6th Street was cut off. The improvement resulted in a land transfer, and then property along 6th Street was subsequently abandoned.
- There is a large telecommunications facility north of I-80 near Keystone Ave.
- The City supports infill development in downtown Reno along Virginia Street; an important initiative is focused on providing UNR students with affordable housing options in the core of downtown.
- The Reno-Stead Airport has developed a Master Plan, which supports expansion of industrial uses in the area. This will increase truck trips through the Reno Spaghetti Bowl interchange.
- The City would like to know if the proposed industrial areas near the Reno-Stead Airport, Daybreak and StoneGate Development were accounted in the future forecast traffic volumes through the project area.
  - NDOT (response): Daybreak was partially included in the model (approximately 1200 households), but StoneGate was not since it was not approved at the time. The forecast traffic volumes are constrained by the Washoe County Consensus Forecast (CF). The CF is a 20-year outlook of population and job growth within Washoe County. The current population forecasts indicate that more residential units are planned (e.g. in Planned Unit Developments or Tentative Maps) than will be needed within the 20-year horizon. A suitability-based model was used which takes into account things like proximity to infrastructure to select which of those parcels will develop over the next 20 years to meet the population growth demand. Thus, not every planned development will build out to full capacity and some show no units built within the modeling timeframe.
- Sewer and water are planned to be extended to the StoneGate Development.
- There is a drainage issue at Lakeside Drive and Moana Lane. Additionally, last year there were flooding issues in the Lemmon Valley neighborhood off of Lemmon Drive at Swan Lake. This is a closed drainage area, rainwater and snow melt stay in the basin.
- Development within the City must be in conformance with the City's Master Plan to be approved. Sometimes the density at developments is not as high as developers anticipate.
- The City just completed an update to its Master Plan-Reimagine Reno; it is expected to be approved next week.
- If the project were not constructed, residential development would likely occur in the south due to the Southeast Connector, and west to Verdi. Sewer and water currently extend to Boomtown to the west.

Reno Spaghetti Bowl

ATTENDEES:	Scott Carey, Reno-Sparks Indian Colony	Jill Kramer, CH2M
	Steve Moran, Reno-Sparks Indian Colony	
PREPARED BY:	Jill Kramer	
DATE:	December 8, 2017	

The project team is conducting an analysis of whether indirect impacts are likely as a result of the Reno Spaghetti Bowl Project. On December 8, 2017, Jill Kramer of the project team met with Scott Carey and Steve Moran of the Reno-Sparks Indian Colony (RSIC). The purpose of the meeting was to gain local insight into the potential for growth in the project study area, both with and without the Reno Spaghetti Bowl, as well as strategies for managing growth in the study area.

The project team presented two exhibits showing the initial Primary and Secondary Area of Potential Effects (APE). The exhibits can be found at the end of these minutes. The APE was developed consistent with guidance documents. The Primary APE is closest to the project and identifies the locations that have the greatest likelihood for indirect effects. It encompasses the social, historic and natural resources that are most directly served by the freeway and its interchanges, and this area may be most susceptible to changes in access. Also, the Primary APE includes the social, historic and natural resources that could be indirectly affected by the encroachment of infrastructure. The Secondary APE illustrates the areas to be evaluated for intraregional land use trends that may be influenced by the project. The Secondary APE largely mirrors the Truckee Meadows Service Area.

Following is a summary of the key points made during the meeting.

- Colony business enterprises include: five Smoke Shops, Walmart, lands leased to car dealerships along Kietzke Ln, and landscaping business in Spanish Springs.
- RSIC owns 15,000 acres north of US 395 in Hungry Valley.
- Important RSIC land uses adjacent to the project include housing, Tribal Health Center, and Truckee River. Please review the RSIC's Comprehensive Land Use Plan for more information. Currently RSIC lands are surrounded by industrial development, and the plan calls for a transition to mixed-use within the sphere of influence (Kietzke Ln to I-580). In general, RSIC tries to follow strategies of the Truckee Meadows Regional Planning Authority.
- Add Anderson Park to the study area map. Also, consider extending the study area to include Kietzke Lane.
- The RSIC is land-locked in downtown Reno. RSIC has been using acquisitions to increase their lands. There is the potential for future growth in Hungry Valley.
- In the North Valley, the development constraint is water.
- Key issues for RSIC are housing, community facilities and commercial enterprises. The Truckee River is culturally very important to the RSIC, and they are looking to improve the connection to the river. Public safety is a concern along the river.
- The largest employers on the Colony are the tribal government, health center (~ 200 employees), Hungry Valley services, smoke shops, Walmart and car dealerships.

- The colony operates its own transit service between RSIC downtown and Hungry Valley. Important RTC of Washoe County transit service includes Route 18 on Glendale Ave/2nd St, Route 12 which follows a similar path, and Route 14 on Mill St.
- The 2nd St and Mill St interchanges are critical to the RSIC's commercial enterprises. Walmart accounts for significant amount of the Colony's revenue. RSIC supports maintaining both 2nd St and Mill St as full access interchanges. In addition to Walmart, these interchanges provide direct access to Renown Hospital, and Grand Sierra Resort.
    - If Walmart left, it would be very difficult for the Colony to lease the space to another large-scale retail development, if there was a change in access at I-580 and 2nd Street. Loss of revenue from Walmart would have a significant effect on the RSIC.
    - The Colony did a land swap for the Northern Nevada Transitional Housing Center at 2595 East 2nd Street, adjacent to the Walmart. The function of this facility is to help reintegrate inmates into society toward the end of their period of incarceration.
- The No-Build Alternative would impact the community. There are significant safety and capacity issues on the freeway that need to be addressed.
- An RFP was recently released by RTC of Washoe County, RSIC and City of Reno to develop plans for a trail on the south side of the Truckee River, which would improve access and connections for the community between the Walmart and the Health Center.
- East 2nd Street was recently rebuilt, which passes through the RSIC lands in downtown. It is very important to maintain a connection between the lands on both sides of 2nd St. There is a pedestrian bridge that provides a link across 2nd St, but it is old and not ADA compliant.
- Reno-Stead Airport is a major economic driver, please review their master plan. The plan describes the industrial and commercial plans for the area. The Reno-Stead Airport was designated as the 1st drone testing site in the nation.
- Resources of potential impact include air quality and noise.
- In the North Valley, water limits development.

See attachments.

Attachment 1: Letter from the Reno-Sparks Indian Colony to Nick Johnson, Nevada Department of Transportation, assessing the impacts of access changes to Walmart and the Reno-Sparks Indian Colony.

Attachment 2: Email from Reno-Sparks Indian Colony to Jill Kramer, CH2M, assessing the impacts of access changes to the Sparks Industrial Area.

RENO-SPARKS INDIAN COLONY

CHAIRMAN'S OFFICE

34 Reservation Road, Reno, NV 89502

Phone: (775) 329-2936 • Fax: (775) 954-9175

October 9, 2017

Nick Johnson
Project Manager
Nevada Department of Transportation
1263 South Carson Street
Carson City, NV 89712

Subject: RSIC Answers to Assessing the Impact of Access Changes to Walmart and RSIC.

Dear Mr. Johnson,

Thank You for the opportunity for the Reno-Sparks Indian Colony (RSIC) to provide the following answers in response to your agency's letter dated July 19, 2017 regarding the potential impact of the potential access changes on Walmart and the RSIC. As a cooperating agency, the RSIC is pleased to work with the Federal Highways Administration and the Nevada Department of Transportation to carefully examine any and all direct & indirect impacts the proposed project may have on the Colony and its members.

Table 2 Question Number 1

Loss of revenue if site no longer viable for Walmart. Beyond just the potential loss of Walmart, is the site viable for any other larger scale commercial development without direct freeway access?

RSIC Answer

Lease, tax and other revenue figures collected by RSIC from the Walmart and other Tribal Enterprises on RSIC lands are confidential and cannot be publically disclosed pursuant to Tribal law and other agreements. Revenue from Walmart and other enterprises located on East 2nd Street and Mill Street is 39% of total revenue from the Colony's commercial real estate projects. Those revenues are used to fund essential government services to its members, pay debt service and provide matching funds for available federal grants. If the site were not longer viable for a Walmart, it would result in staggering losses in revenue to the RSIC Tribal Government. The revenue declines would result in a loss of tribal government staff employment, a decrease in the Colony's established debt limits, an increase in the financial burden to make debt service payments, probably a lowering of the Colony's investment grade credit rating, a decrease in government services available to its members, a significant decrease in the Colony's ability to plan for capital expenditures, and the Colony's ability to attract federal grants that require

matching funds as a condition of approval. The property was carefully planned and designed by the RSIC in close coordination with Walmart with a big box retail store in mind and dependent upon excellent access via direct freeway access. Without direct freeway access to the site, the property would not be viable for any other similar large scale retail development. Without direct freeway access to the site, redevelopment that would generate the tribal tax revenue at a level equal to Walmart is not possible. The loss of Walmart equals to a permanent loss of revenue that would significantly negatively impact RSIC revenues and Tribal Government services provided to RSIC Tribal Members. The building and site was designed specifically for Walmart operations and business and would not work with any other retailers. Therefore, the site would potentially need substantial investment in the building and site to accommodate another large scale commercial development.

Table Question Number 2

Lease payments – what is lost if Walmart no longer viable at location because of project effects? Who or what would be affected (i.e., programs/funded positions – government and health center)?

RSIC Answer

The specific amount and type of lease payments paid to the RSIC from Tribal Enterprises on RSIC lands are confidential and cannot be publically disclosed in accordance with Tribal law and other agreements, including the Walmart lease with the Colony. However, the RSIC estimates that a loss of any lease payment from Walmart, or any other Tribal Enterprise deemed no longer viable as a result of the proposed project would negatively impact Tribal Government revenues. A decrease in Tribal Government revenues would lead to a substantial reduction in the following RSIC services provided to Tribal Members; Administration, Finance, Human Resources, Planning, Information Technology, Cultural Resources, Enrollment, Tribal Court, Public Works, Seniors, Human Services, Environmental, Recreation, Law Enforcement, Health, Fire, Housing, Emergency Management, K-12 Education, Child Care, Higher Education, Library, Head Start, and Language. In addition to a reduction in services provided, there would be a loss of many positions within the Tribal Government that are funded by RSIC general fund revenues. Without knowing the full extent of the proposed project, it's difficult to quantify the direct or indirect affects the loss of Walmart or any other Tribal Enterprise would have to the RSIC.

Table 2 Question Number 3

What, if any, are the employment opportunities lost?

a. *Number of RSIC members employed.*

RSIC Answer

The Tribal Government is the largest single employer of enrolled members of the RSIC, and the majority of Tribal Government positions are held by Tribal Members. A loss of Tribal Government positions as a result of reduced Tribal revenues would directly impact Tribal

Member employment opportunities and the overall economy of the RSIC. If Walmart vacated the site, the loss of tribal government employees is estimated at 100-125 individuals. A reduction in Tribal Government jobs would have a disproportionately high and negatively adverse impact on the RSIC and its Tribal Members. A loss of Tribal Members in positions providing Tribal Government services on the reservation would lead to an overall decrease in the quality of services provided to Tribal Members. Less Tribal Members providing fewer Tribal Government services to Tribal Members on the reservation would lead to a reduced quality of life for the RSIC. The Walmart provides an opportunity for Tribal Members to work and earn a living on their own reservation. Since its opening, the Walmart has not provided significant employment for Tribal Members living on the reservation, although the significant increase in tribal government revenues from Walmart has provided for the expansion of tribal government and health center staff. If the Walmart were to close, the impact would be the elimination of existing jobs held by Tribal Members, future employment opportunities for Tribal Members and a loss of Tribal sovereignty & self determination for the RSIC.

Table 2 Question Number 4

Provide additional details for a better understanding of Assembly Bill 299 (passed in 2005 by Nevada Legislature). RSIC proposed to share sales tax revenue from its projects to benefit the Washoe County School District. What does the loss of Walmart mean with regards to revenue sharing?

RSIC Answer

The collaboration in AB 299 between the RSIC, State of Nevada and WCSD was carefully designed to benefit all parties through increased revenue, new community amenities, revenue sharing for education, and increased urban development and private partnerships.

Using Tribal tax revenues and a 1995 Tribal municipal bond, the Colony purchased multiple properties and amassed 22-acres just east of its downtown land base. However, because the properties had been the site of several industrial businesses, the RSIC partnered with the Environmental Protection Agency and the Nevada Division of Environment Protection, to remove soil contaminated with pesticides, petroleum hydrocarbons, metals, polychlorinated biphenyls (PCBs), lead, and nitrogen. After the environmental cleanup, the RSIC worked with the Washoe County Flood Control Project, the Washoe County Public Works Department, the Nevada Departments of State Lands, the Army Corps of Engineers, and Walmart to construct a 0.4 mile floodwall and levee along the south bank of the Truckee River between I-580 and the Glendale bridge. The successful redevelopment has transformed an unsightly former industrial site of trucking terminals, printing plants, construction yards, pawnshops and strip clubs into a major commercial area. In addition the project located next to the region's largest resort-casino has improved the environment, regional flood control, and enhanced the area for recreational and tourism.

AB 299 proposed to spend 1/3 of the Walmart revenue to pay for the bond issue used to finance the design and construction of a new tribal clinic; 1/3 of the revenue goes toward additional funds to the tribal government's general fund; and 1/3 of the revenue is shared with the state and

Washoe County School District. In accordance with Assembly Bill 299, which unanimously passed the Nevada Legislature in 2005, the RSIC entered into a Development and Finance Agreement (DFA) with the State of Nevada to implement the revenue sharing agreement.

The Colony worked with the Nevada Division of Public Works to design and construct the new state-of-the art facility for the Department of Corrections. The new $8 million ($8,000,000.00) facility was constructed by the RSIC and financed using a share of the sales tax proceeds from the Walmart project. Upon completion of the new facility, the Colony and the State Lands swapped the former Northern Nevada Restitution Center (2595 E. 2nd Street) and the site of the new facility (225 Sunshine Lane), free and clear to the State of Nevada. If the proposed project were to cause the Walmart to close, it would create a loss of the sales tax proceeds the RSIC needs to pay off the $8 million dollar it owes from constructing the facility for the State.

Besides diversifying the Colony's tax base from sole reliance on tobacco sales, Tribal revenues from the Walmart played a critical role in the construction of the $20 million RSIC health center located at 1715 Kuenzli Street. The 65,000 square-foot health center not only provides medical care for the RSIC tribal members, but for an additional 9,000 Native American and Alaskan Natives living in Northern Nevada. In addition to serving these populations, the RSIC health center has been designated as a main point of distribution center for vaccinations during a public health emergency in Washoe County.

AB 299 was carefully negotiated between the RSIC, State of Nevada and WCSD to help solve a projected severe future funding problem for new school construction and needed renovations of older schools. AB 299 dictates that a portion of the sales tax revenue from the Walmart store on RSIC lands be paid to the WCSD. The RSIC anticipates that amount to be $500,000 annually with an increase to about $1,000,000 when the loan for construction expires. If Walmart ceases operations for any reason, the payment to WCSD ceases. The first $500,000 payment from the RSIC to the WCSD was made in March 2017. The potential loss of Walmart would significantly jeopardize the RSIC's financial commitments required under AB 299, and would negatively impact the benefits realized through this unique partnership by the RSIC, State of Nevada and WCSD.

Table 2 Question Number 5

Are there current plans for the former restitution center?

RSIC Answer

Economic self-determination has been the cornerstone of Federal Indian policy in the modern era, a policy supported by all three branches of the Federal Government and every President since Richard Nixon. The essence of this policy is to encourage and facilitate Indian tribes to take more direct control over their destiny and become less reliant on Federal, State and Local programs and services. One of the key outcomes of AB 299 passed unanimously by the Nevada Legislature was that the RSIC gained ownership of the property that formerly housed the state restitution center. Since the RSIC has gained ownership of the property it has made significant investments to install infrastructure improvements and improve the condition of the property. The RSIC has recently demolished the former state restitution center buildings on the site in

order to improve the safety and visual appeal of the area. At this point the RSIC does not have any specific plans that it can publically disclose for redeveloping the site. However, the main goal of acquiring this site was to redevelop the site into a commercial use to promote Tribal self-sufficiency by creating employment opportunities for Tribal Members and increasing RSIC government revenues. The Reno Spaghetti Bowl project should carefully consider the impact the proposed project may have to this site, as well as the Colony's two smoke shops, one located at the E. 2nd Street interchange and one located at the Mill Street interchange. A loss or change in access to the former state restitution center site from the E. 2nd St/Glendale Ave interchange could have a significant impact of the viability of this site for a future commercial project. Additionally, any reconfiguration of Galletti Way across this site or any other proposed project right of way needs should carefully examine the future development potential of the site and the potential impacts to the RSIC.

Table 2 Question Number 6

Are there RSIC outstanding bonds that need to be repaid or has this already been done?

RSIC Answer

Based on the approval of AB 299, in 2006, the RSIC issued a $16,000,000 bond issue to finance the design and construction of the health center located at 1715 Kuenzli Street. The 65,000 sq ft health center provides medical services to RSIC enrolled members and 9,000 Native American and Alaskan Natives living in Northern Nevada. In addition to serving these populations, the RSIC health center has been designated as a main point of distribution center for vaccinations during a public health emergency in Washoe County. As noted in legislative hearings, Walmart revenues would be used to pay the debt service related to the tribal health center.

In 2013, the RSIC also issued an $8,000,000 bank loan to finance the design and construction of the Northern Nevada Transitional Housing Center. This state of the art facility has allowed the State of Nevada Department of Corrections to expand its services and move away from incarceration of minor offenders and focus on skill development. As was noted in AB 299 hearings, Tribal tax revenues from the Walmart project and other Tribal enterprises near the proposed Reno Spaghetti Bowl project area were used to secure the issue of both of these bonds and those revenues are used to pay the debt service related to these bonds and bank loans. The RSIC continues to use the Tribal tax revenues from these Tribal enterprises to pay off its outstanding bond obligations. If the proposed Reno Spaghetti Bowl project were to cause a decrease in Tribal tax revenue from these Tribal enterprises it would cause a loss of RSIC government services. Under the terms of the existing bonds and the requirements of AB 299 Tribal tax revenues must be used to pay off bond obligations before going to fund RSIC government services.

Table 2 Question Number 7

What does current zoning allow to occur on the property and what could be done with site if no longer viable for Walmart?

RSIC Answer

In 1995 the Tribal Council established a policy of land acquisition as a goal to "meet economic, social, and health needs of the Tribal membership, as well as to exercise its constitutional obligation to promote the general welfare of the Tribe". The Walmart property was acquired and cleaned up by the RSIC over many years of careful planning and collaboration with Federal, State and Local governments. Past marketing and feasibility studies undertaken by the RSIC have concluded that the highest and best use for this property is big box retail commercial. If the site were deemed no longer viable for a Walmart or other big box retail project, it would make all of the past inter-governmental collaboration and careful planning obsolete in addition to a negative impact to RSIC revenues and self-sufficiency goals. The former state restitution center and the Walmart properties are currently zoned commercial by the RSIC zoning code. Under the RSIC zoning code other commercial uses would be allowed on both properties if the Walmart were no longer viable. Other proposed commercial uses would have to be carefully examined by the RSIC Planning Department and brought to the Tribal Council for review and consideration.

Table 2 Question Number 8

Walmart leases from the RSIC?

a. *Lease payments tied to store sales or just an annual payment?*
b. *Length of Lease?*
c. *Can one or both parties terminate the lease and what are the reasons?*

RSIC Answer

The specific terms of the lease between the RSIC and Walmart are confidential and therefore this requested information cannot be publically disclosed.

Table 2 Question Number 9

Are there other concerns or issues to be addressed as a result of the potential construction and operation of the proposed project?

RSIC Answer

Any potential construction of the proposed project must carefully consider the impacts to the RSIC community and Tribal enterprises, both in terms of alternatives and construction methods and phasing of proposed improvements. In the early 2000's when NDOT performed improvements to the Reno-Sparks freeway system and Spaghetti Bowl interchange there was a significant impact to the RSIC community and Tribal enterprises from construction. While sound walls and other freeway improvements were being made on I-80 and I-580, there were long term closures to the E. 2nd St./Glendale Ave and Mill Street interchanges. These long term ramp closures and construction activity created reduced transportation access for RSIC Tribal Members living in both the Reno and Hungry Valley communities using the freeway system for employment and to access services within the area.

Additionally, long term ramp closures on E. 2nd St./Glendale Ave interchange significantly limited access to Tribal enterprises and caused permanent changes in consumer habits. These consumer habits changes led to a permanent loss of market share as consumers continued to make purchases from businesses located off of RSIC lands after the construction was completed. As evidenced by the recent project on E. 2nd St./Glendale Ave construction activity can have a negative impact on the Walmart and other Tribal enterprises. The biggest sales periods for the Walmart are the two weeks prior to the Labor Day holiday and the holiday shopping season. Any future construction of the proposed project must avoid impacting the Walmart during these sales periods in order to avoid a loss of RSIC tax revenue and direct impacts to Tribal government services. Additionally, the future construction of the proposed project must be planned to limit the impact of the transportation access to RSIC Tribal Members and Tribal enterprises located on East Second Street and Mill Street.

In closing, although the Reno-Sparks freeway system is an important piece of transportation infrastructure for the RSIC, its Tribal Members and the entire region; any proposed alternative that results in the direct or indirect impacts to Walmart's ability to function as it does today cannot be mitigated to an insignificant level. The RSIC looks forward to continuing to work as a cooperating agency on this proposed project and to improve the safety & efficiency of the Reno-Sparks freeway system.

If you have any questions or need any additional information about the RSIC's comments, the lead staff contact is Scott Nebesky, Planning Director (775-785-1363; snebesky@rsic.org).

Sincerely,

Arlan D. Melendez

Arlan D. Melendez
Tribal Chairman

From: Scott Carey
To: Kramer, Jill/CHI
Subject: RE: RSIC Walmart Letter [EXTERNAL]
Date: Tuesday, December 12, 2017 11:19:52 AM

Jill,

Over the weekend I came up with another point that I would like to bring to your attention regarding the existing built environmental and future development with the proposed Reno Spaghetti Bowl project. The Sparks Industrial Area is currently one of the region's largest employment centers and is served by the Union Pacific Railroad and has freeway access from both I-80 and I-580. I know that a lot of the businesses within the Sparks Industrial Area rely on the Glendale Avenue/E. 2nd Street interchange for access for their customers and suppliers. The elimination of the Glendale Avenue/E. 2nd Street interchange would have a negative impact on these existing businesses within this important regional employment center.

As you are well aware the region is experience a lot of large scale industrial growth outside of the urban core. The Sparks Industrial Area is an older employment center for the region and its smaller buildings provide an ideal space for new small business start ups and entrepreneurs. Without sufficient freeway access to serve these businesses along I-580, the region will not be able to provide employment opportunities within the urban core and it become harder for new small business to locate within the Sparks Industrial Area and for the area to continue to be a regional employment center.

Thank You,

Scott H. Carey
Planner
RSIC-Planning Department
775-785-1363 x 5406
1937 Prosperity Street
Reno, NV 89502

From: Scott Carey
Sent: Friday, December 08, 2017 12:08 PM
To: 'jill.kramer@ch2m.com'
Subject: RSIC Walmart Letter

Jill,

It was a pleasure to meet with you today, as a follow up I wanted to provide you with my contact information and a copy of the letter the Reno-Sparks Indian Colony submitted about the impact of the project on the Walmart. This formally outlines what Steve Moran and myself were talking about concerning the impacts to the Colony from a the loss of revenue from the Tribal Enterprises caused by the project.

If you have any questions or need any additional information please let me know.

Thank You,

Scott H. Carey
Planner
RSIC-Planning Department
775-785-1363 x 5406
1937 Prosperity Street
Reno, NV 89502

Reno Spaghetti Bowl

ATTENDEES:	Amy Cummings, RTC Washoe County	Steve Cooke, NDOT
	Daniel Doenges, RTC Washoe County	Jill Kramer, CH2M
PREPARED BY:	Jill Kramer	
DATE:	December 8, 2017	

The project team is conducting an analysis of whether indirect impacts are likely as a result of the Reno Spaghetti Bowl Project. On December 8th, the project team met with Amy Cummings and Daniel Doenges of the Regional Transportation Commission of Washoe County. The purpose of the meeting was to gain local insight into the potential for growth in the project study area, both with and without the Reno Spaghetti Bowl, as well as strategies for managing growth in the study area.

The project team presented two exhibits showing the initial Primary and Secondary Area of Potential Effects (APE). The exhibits can be found at the end of these minutes. The APE was developed consistent with guidance documents. The Primary APE is closest to the project and identifies the locations that have the greatest likelihood for indirect effects. It encompasses the social, historic and natural resources that are most directly served by the freeway and its interchanges, and this area may be most susceptible to changes in access. Also, the Primary APE includes the social, historic and natural resources that could be indirectly affected by the encroachment of infrastructure. The Secondary APE illustrates the areas to be evaluated for intraregional land use trends that may be influenced by the project. The Secondary APE largely mirrors the Truckee Meadows Service Area.

Following is a summary of the key points made during the meeting.

- Other large-scale developments in the region include Spanish Springs and Kiley Ranch in Sparks.
- Other important land uses in the project area include Centennial Plaza, maintenance facility, bus station at Villanova, Fountain District Development (Jacobs Entertainment Inc.'s plan for the West 4th Street corridor in downtown into a new arts and entertainment district); West 2nd Street Project (this project is more conceptual than the Fountain District Development), and The Nugget.
- A bicycle path is proposed on the south side of the Truckee River from the Walmart heading west towards downtown. Two issues for this project include passing underneath I-580 and Kietzke Avenue bridge.
- RTC of Washoe County has a shapefile of additional planned improvements, which should be added to the study area maps.
- Most development is taking place in North Valleys; however, the capacity of US 395 is a constraint to development. Other constraints include sewer capacity and water. The Truckee Meadows Water Authority is limited as to how much can be discharged into the Truckee River, and it is approaching capacity.
- The constraints identified as part of the US 395 project should be reviewed for consideration with this project.

- Review the Washoe County Public Lands Bill on the County's website. This site has acreages and maps of federal lands in the project study area.
- Truckee Meadows Water Authority recently submitted a corridor application.
- There is little correlation between future development and the RSB project.
- RTC is interested in the proposed project's effect on the regional network, as the arterial network does not have many "super streets", that is many high access controlled arterial streets.
- In terms of RTC's regional priorities: 1) Reno Spaghetti Bowl Project, 2) US 395 North, 3) Pyramid Highway/US 395 Connector.
- The primary and secondary study area are reasonable.
- Add the Nugget to the map.
- If the project is not constructed, development will likely occur in the same location (North Valley), although it may happen later in time.
- The City will phase in the Stone Gate development, likely over 30 years.
- Between Stead Blvd and Lemmon Drive about 3 miles north of Parr Blvd there is ongoing industrial and warehouse development, on the south/west side of US 395. RTC has been asked to improve North Virginia Street, which runs parallel to US 395 to the west, to 4 lanes to the Amazon facility.
- Economic Development Authority of Western Nevada (EDAWN) may have information on industrial and warehousing development useful for the project. http://www.edawn.org

RECORD OF MEETING

Reno Spaghetti Bowl

ATTENDEES:	Jim Rundle, City of Sparks	Jill Kramer, CH2M
		Carly Dutkiewicz, CH2M
PREPARED BY:	Carly Dutkiewicz & Jill Kramer	
DATE:	January 16, 2018	

The project team is conducting an analysis of whether indirect impacts are likely as a result of the Reno Spaghetti Bowl Project. The project team conducted a conference call with Jim Rundle, Planning Manager, Planning and Zoning, City of Sparks on January 16th. The purpose of the call was to gain local insight into the potential for growth in the project study area, both with and without the Reno Spaghetti Bowl, as well as strategies for managing growth in the study area.

The project team presented two exhibits showing the initial Primary and Secondary Area of Potential Effects (APE). The exhibits can be found at the end of these minutes. The APE was developed consistent with guidance documents. The Primary APE is closest to the project and identifies the locations that have the greatest likelihood for indirect effects. It encompasses the social, historic and natural resources that are most directly served by the freeway and its interchanges, and this area may be most susceptible to changes in access. Also, the Primary APE includes the social, historic and natural resources that could be indirectly affected by the encroachment of infrastructure. The Secondary APE illustrates the areas to be evaluated for intraregional land use trends that may be influenced by the project. The Secondary APE largely mirrors the Truckee Meadows Service Area.

Following is a summary of the key points made during the meeting.

- Verify the eastern project area limits along I-80. The City of Sparks has recommended Vista Blvd as the eastern limit along I-80 to include the newly constructed Southeast Connector, which will redirect some traffic from the Spaghetti Bowl.
- The project should be planned and designed such that it does not divide communities.
- The project should be planned and designed to improve safety while not creating a substantial amount of capacity such that it induces sprawl.
- South Reno and the Tahoe-Reno Industrial Center are major employment centers in the region. In Sparks at Sparks Blvd/Pyramid Way, Renown plans to construct a hospital similar in size to the Regional Medical Center in South Reno. This facility is forecast to provide a lot of employment, as well as reduce the number of north-south trips.
- There is high-density, single-family development (~1500 units) being considered, north of Highland Ranch Pkwy and west of Pyramid Way that is not part of the Truckee Meadows Regional Planning Agency's (TMRPA) approved future unit database. The land is a former granite quarry. The developer and City are currently working on a zoning change from business park to single-family residential.
- The City occasionally departs from its master plan, but the changes are usually minor. It is difficult to depart from the master plan. The City has sized its infrastructure according to the master plan and has developed an impact fee system based on this sizing. The proposed high-density, single family residential development on the former granite quarry site is one of the

more extensive zoning change requests. This development would redevelop the former quarry to single-family residential, which would result in increased sewage generation and travel trips.

- The City has not yet had an opportunity to review the primary or secondary area of potential effects maps that were emailed by Alex Hoeft; the City will review the maps and forward any comments.
- There is a lot of congestion along I-80 eastbound in the morning headed to the Tahoe-Reno Industrial Center and westbound in the afternoon.
- The City is not aware of any development or plans to develop in response to the plans to reconstruct the Reno Spaghetti Bowl.
- Without the Spaghetti Bowl reconstruction, the City expects development of employment centers in the North Valleys, so residents can live and work in the same area. If employment centers don't relocate, the interchange will need to be reconstructed. It would be interesting to calculate the cost for an employer to relocate 10-minutes north of downtown.
- The City inquired about the region's goal for the project. Has the study identified who we're trying to move, and where we want to move them?
- TMRPA is in the process of updating its regional plan; it is expected to be completed in late 2018. The recommendations in this plan will require Washoe County, Reno, and Sparks to revisit their plans to ensure conformance with the regional plan.
- The Reno Spaghetti Bowl reconstruction could have a positive influence on redevelopment at a mixed-use development proposed at I-580/Oddie Blvd that would provide approximately 800+ jobs. Also, Renown is looking to purchase the former Lowe's at the I-80/Sparks Blvd service interchange and convert it into a medical center. The Tahoe-Reno Industrial Center had a positive effect on the development at Victorian Square.
- The capacity of the Truckee Meadows Water Reclamation Facility is a major development constraint, as the plant can only process so much nitrogen. The City cannot approve a tentative map if the facility's capacity cannot support the proposed development. Sewer capacity is expected to be a development constraint before available potable water. [Note: Planned Unit Development (PUD) map boundaries show plans approved by elected zoning officials and it replaces the master zoning code. A tentative map boundary is one step closer to the final map. A developer might only file a tentative map for a certain number of units. The developer's plan undergoes a discretionary review – for example, is water/sewer available? Is there road capacity? The tentative map is approved or not approved based on this review. These developments may develop earlier because they are further along in the planning process.]
- Last year Sparks and Reno were not in compliance with some federal air quality standards in the winter. This could lead to the state not approving a tentative map due to non-attainment in the future.

Reno Spaghetti Bowl

ATTENDEES:	Scott Bassett, UNR	Charlie Webb, CH2M
	Scott Kelley, UNR	Jill Kramer, CH2M
PREPARED BY:	Jill Kramer	
DATE:	December 8, 2017	

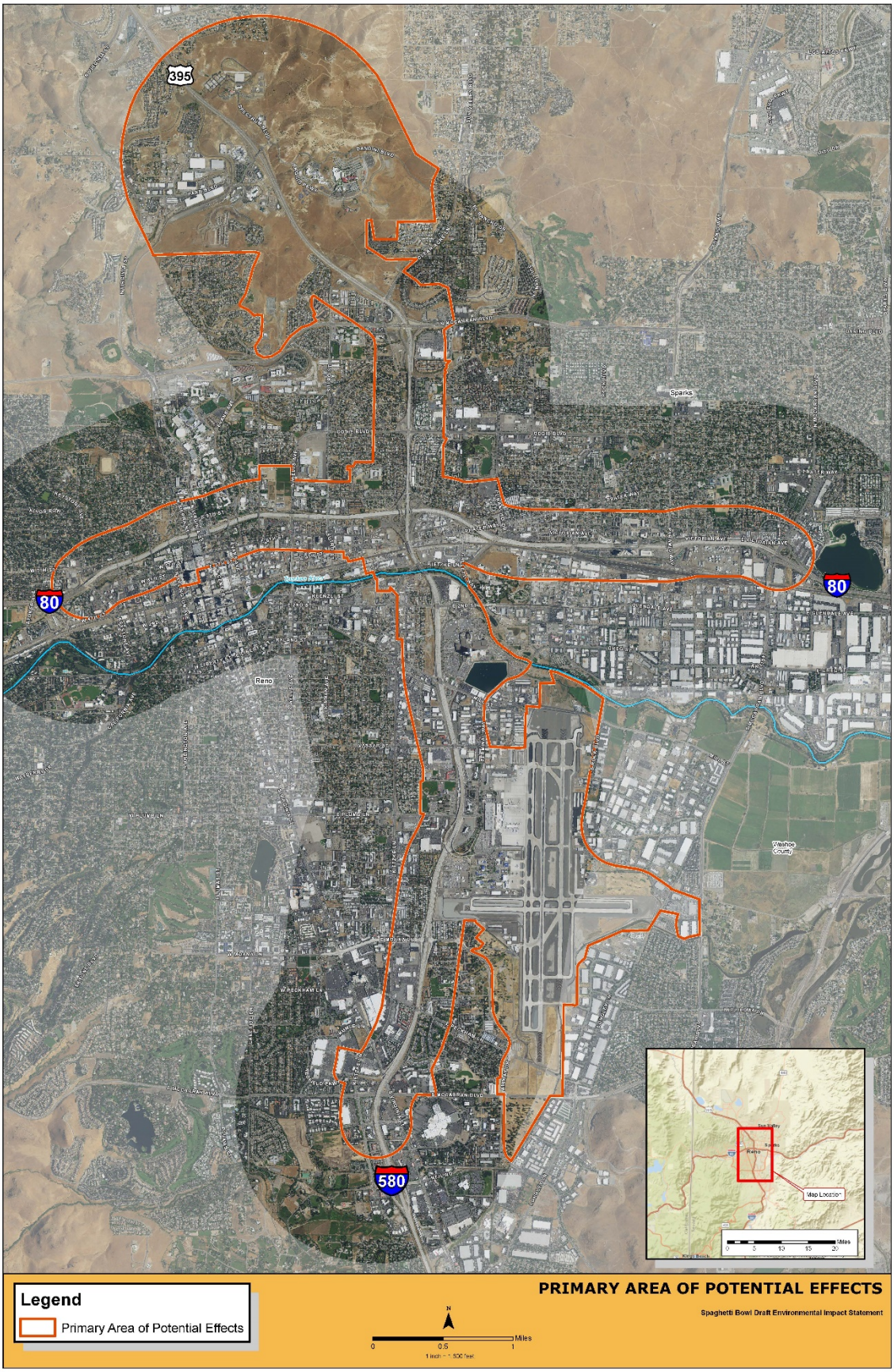
The NDOT project team is conducting an analysis of whether indirect impacts are likely as a result of the Reno Spaghetti Bowl (RSB) project. On December 7, 2017, the project team met with Scott Bassett and Scott Kelley, Department of Geography, University of Nevada, Reno. The purpose of the meeting was to gain local insight into the potential for growth in the project study area, both with and without the Reno Spaghetti Bowl, as well as strategies for managing growth in the study area.

The project team presented two exhibits showing the initial Primary and Secondary Area of Potential Effects (APE). The exhibits can be found at the end of these minutes. The APE was developed consistent with guidance documents. The Primary APE is closest to the project and identifies the locations that have the greatest likelihood for indirect effects. It encompasses the social, historic and natural resources that are most directly served by the freeway and its interchanges, and this area may be most susceptible to changes in access. Also, the Primary APE includes the social, historic and natural resources that could be indirectly affected by the encroachment of infrastructure. The Secondary APE illustrates the areas to be evaluated for intraregional land use trends that may be influenced by the project. The Secondary APE largely mirrors the Truckee Meadows Service Area.

Following is a summary of the key points made during the meeting.

- Contact Storey County to get information on new housing in that area. Nevada State Route 439 was recently completed to US 50, providing access between Silver Springs and the Tahoe-Reno Industrial Center (TRIC), the world's largest industrial center.
- Housing is under development in Lyon, Storey and Washoe Counties to support the people anticipated to work at TRIC.
- Housing is a big concern in the region, Reno is now in the top 5 most expensive rental markets.
- Major employers at the TRIC include Tesla Gigafactory, Walmart Distribution Center, PetSmart Distribution Center, Jet.com Fulfillment Center, and Zulily Warehouse.
- Major employment centers in the region include the industrial area of the North Sparks/Spanish Springs (UPS and Amazon), warehousing to the south near the airport, and downtown Reno.
- There are very few parallel routes to I-80 and I-580/US 395.
- Reno is using planned unit developments (PUD) to direct development. Sparks is using traditional zoning.
- Storey County wants to develop more PUDs. The USA Pkwy/US 50 area is a focus of their residential plans. The new housing is intended for TRIC employees. Fernley has also seen more demand for residential; rents have increased a few hundred dollars per month recently. Storey County PUDs and Fernley could attract some TRIC employees that now live in Reno and Sparks.

- Sewage treatment is the limiting factor for new development. There is one plant south of I-80 next to the new Southeast Connector. A second plant may be needed, likely on the north side of Reno/Sparks area, perhaps near Spanish Springs.
- Water related issues are important in the region; the Truckee River supports a lot of diversity. Water run-off from the road will be a very important issue for the Piute Tribe.
- The Golden Eagle is present in the area. Induced residential development could adversely affect the species, which are averse to living in urban areas. Red-tailed hawks are okay living in urban areas.
- Air Quality (especially ozone inversion experienced in the winter):
    - Air quality analysis should account for temperature inversions in the winter
    - Desert Research Institute monitors air quality in the Reno area
- The RSB project has the potential to expand residential development in the North Valleys and Spanish Springs. Spanish Springs will remain residential with small-scale retail and Costco, but North Valleys could support housing and jobs.
- The region may develop differently with and without the project but it is difficult to quantify. The project may spur more development in Spanish Springs and North Valleys and reduce development opportunities in downtown Reno, which is supported by the City of Reno Master Plan. The industrial area north of RSB could become a new employment center, such as near the Reno-Stead Airport.
- The RSB project will not affect Fernley. Without the RSB there could be pressure to develop UNR's ag lands, and redevelopment of the Old Southwest neighborhood.
    - UNR's ag land property is located on the east side of Reno near the Southeast Connector; UNR tried to sell it over the years but there was too much opposition to the sale.
- Are induced trips being accounted for? If yes, how? This is a good question to ask staff at the RTC of Washoe County.
- Two staff at UNR, Tom Harris and Brian Bonnenfant, study and evaluate business location in the region.
- UNR staff asked if dedicated high occupancy vehicles lanes will be provided as part of the project.


395
80
80
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Sparks
Reno
Washoe County
Legend
Primary Area of Potential Effects
PRIMARY AREA OF POTENTIAL EFFECTS
Spaghetti Bowl Draft Environmental Impact Statement
N
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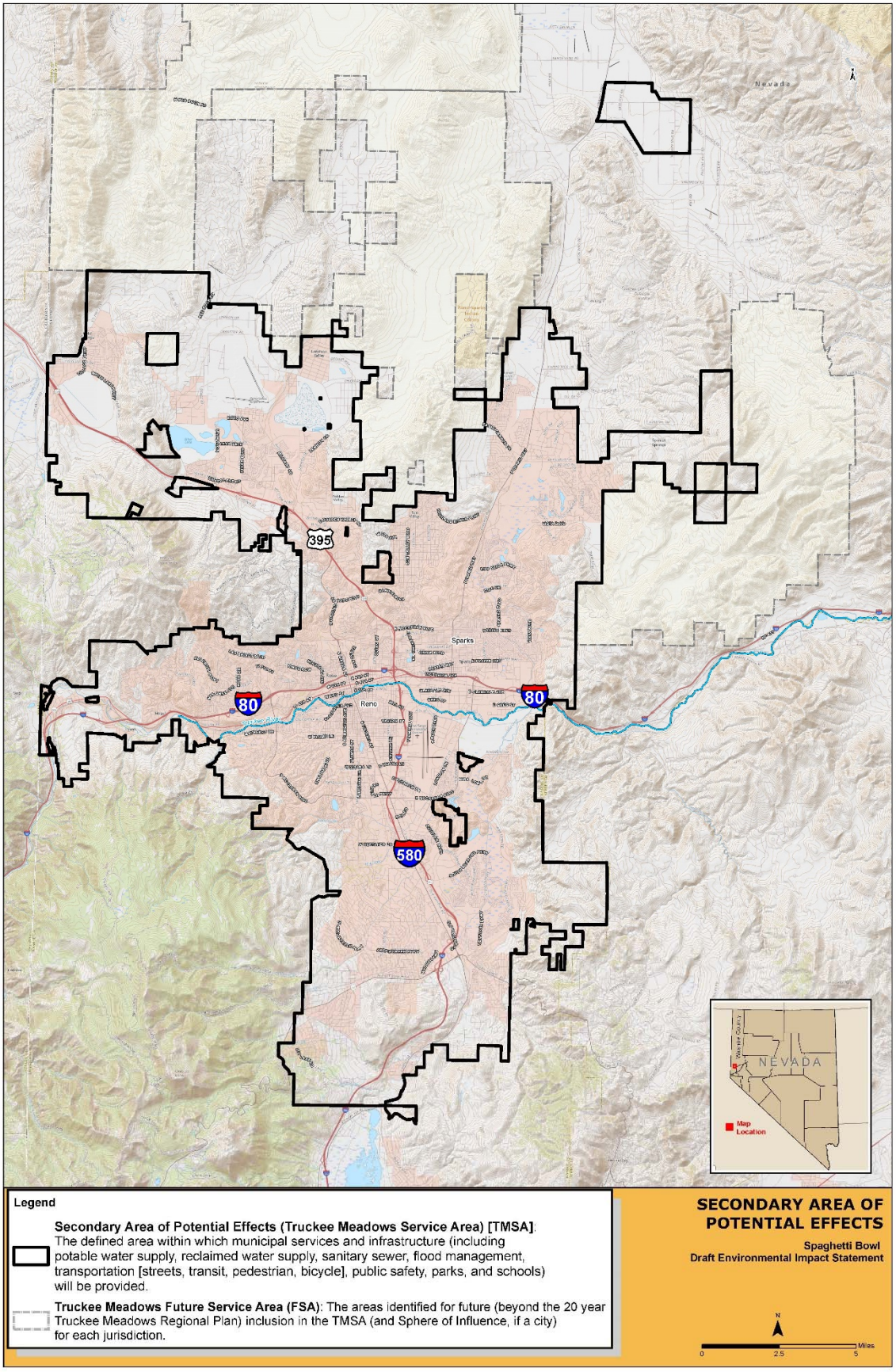
0.5
1
Miles
1 inch = 1,500 feet
Map Location


Nevada
395
Sparks
Reno
80
80
580
NEVADA
Map Location
Legend
Secondary Area of Potential Effects (Truckee Meadows Service Area) [TMSA]: The defined area within which municipal services and infrastructure (including potable water supply, reclaimed water supply, sanitary sewer, flood management, transportation [streets, transit, pedestrian, bicycle], public safety, parks, and schools) will be provided.
Truckee Meadows Future Service Area (FSA): The areas identified for future (beyond the 20 year Truckee Meadows Regional Plan) inclusion in the TMSA (and Sphere of Influence, if a city) for each jurisdiction.
SECONDARY AREA OF POTENTIAL EFFECTS
Spaghetti Bowl
Draft Environmental Impact Statement
N
0
2.5
5
Miles

Attachment 3 Email Correspondence with Regional Transportation Commission of Washoe County: 2040 Regional Transportation Plan Model

Kramer, Jill/CHI

Subject: 2040 RTP Question [EXTERNAL]

Begin forwarded message:

From: Jeremy Smith <JSmith@tmrpa.org>
Date: February 21, 2018 at 2:06:07 PM PST
To: Xuan Wang <XWang@rtcwashoe.com>, "Roldan, Jim/SCO" <Jim.Roldan@CH2M.com>
Cc: "Wright, Christopher D" <CWright@dot.nv.gov>, "Paleti Siva Sai Krishna, Chaitanya/RIC" <Chaitanya.Paleti@ch2m.com>, Daniel Doenges <DDoenges@rtcwashoe.com>
Subject: RE: 2040 RTP Question [EXTERNAL]

Hi Jim,

Xuan is absolutely correct in saying that the RTP is constrained by the Consensus Forecast (CF). The CF is a 20-year outlook of population and job growth within Washoe County. The current population forecasts indicate that we have more residential units planned (e.g. in Planned Unit Developments or tentative maps) than will be needed within the 20-year horizon. We use a suitability-based model that takes into account things like proximity to infrastructure to select which of those parcels will develop over the next 20 years to meet the population growth demand. Thus, not every planned development will build out to full capacity and some show no units built within the modeling timeframe (e.g. Spring Mountain).

That said, it is impossible to correctly predict exactly which developments will start, continue and be fully realized over the next 20 years. When RTC was compiling the 2040 RTP, the development potential of the North Valleys was particularly volatile (and arguably still is) and so they undertook the North Valleys study to help understand transportation capacity constraints in the North Valleys area in advance of identifying the 2040 RTP projects list. RTC's North Valleys study simulated a build out of approved and speculative projects in that area, so Stonegate was considered at that time. The results of the North Valleys build out analysis helped RTC staff compile the RTP project list in association with the CF model.

You can see the list of developments we are tracking and using in our modeling work by visiting this online map viewer:
https://tmrpa.maps.arcgis.com/apps/webappviewer/index.html?id=c53907558247444f9ac63980344a288d

Also, you can check out the most recent CF by following this link:
http://www.tmrpa.org//files/reports/16-09-28%20WC%20Consensus%20Forecast%202016%20Final%20with%20Appendices.pdf I'm working toward the 2018-2038 version now and it will be available in the next few months.

I'm happy to answer any further questions you may have.

Best regards,
Jeremy

Jeremy M. Smith, Ph.D.
GIS Coordinator
Truckee Meadows Regional Planning Agency
1105 Terminal Way Suite 316
Reno, NV 89502
775.321.8390
www.tmrpa.org

From: Xuan Wang
Sent: Wednesday, February 21, 2018 1:23 PM
To: Roldan, Jim/SCO
Cc: Wright, Christopher D; Paleti Siva Sai Krishna, Chaitanya/RIC; Jeremy Smith; Daniel Doenges
Subject: RE: 2040 RTP Question

Jim,

Regarding the two developments, by looking at the TAZ data, Butler Ranch was partially included in the model (about 1200 households), and Stonegate was not included in the model since it was not approved at the time.

The model TAZ data was developed by Jeremy at TMRPA. The forecast is based on factors such as the approved units and how likely they will be built, and constrained by the Consensus forecast totals. Not all approved developments are included as fully built out in the model.

Jeremy, please add if I missed anything. If you have a list of developments included, please send it to Jim. Thanks!

Xuan

From: Roldan, Jim/SCO [mailto:Jim.Roldan@CH2M.com]
Sent: Wednesday, February 21, 2018 10:19 AM
To: Xuan Wang <XWang@rtcwashoe.com>
Cc: Wright, Christopher D <CWright@dot.nv.gov>; Paleti Siva Sai Krishna, Chaitanya/RIC <Chaitanya.Paleti@ch2m.com>
Subject: 2040 RTP Question

Good Morning Xuan,

As you may recall, I am the traffic engineer with CH2M (now Jacobs) working on the Reno Spaghetti Bowl project for NDOT. I had a question for you I am hoping you can help answer. Can you tell me if the following developments are included in the latest RTC RTP 2040 model:

- Daybreak Development (formerly called Butler Ranch)
- StoneGate Development

I looked in the RTP documentation and I do not see any list of private developments included in the model. We also took a look at the 2040 modeling files we have from you guys and there is not a shapefile layer that lists development attributes. Do you happen to have a list? Or can you tell me if these developments are included?

Thanks for your help!

Jim Roldan, P.E.

Senior Transportation Engineer
Office: 714-435-6225

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Santa Ana, CA 92707
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Attachment 4 Traffic Forecast Methodology and Traffic Volumes Memorandum, and Email Correspondence with Regional Transportation Commission of Washoe County: Traffic Forecast Methodology and Traffic Volumes Memorandum

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
1263 S. Stewart Street
Carson City, Nevada 89712

BRIAN SANDOVAL
Governor

RUDY MALFABON, P.E., *Director*

June 1, 2017

In Reply Refer to:

Jim Roldan
CH2M
6 Hutton Centre Drive, Suite 700
Santa Ana, CA 92707

Dear Mr. Roldan:

The Nevada Department of Transportation's Traffic Information Section has reviewed the *forecasting methodology and traffic volumes* used in the Reno Spaghetti Bowl Traffic Forecasting Memorandum produced by Jim Roldan of CH2M dated May 23, 2017. The current and future traffic volumes seem reasonable for use in the traffic operation analysis. Should you require clarification or additional information please contact myself or Chris Wright at (775) 888-7443.

Sincerely,

Mark Wooster
NDOT Traffic Information Chief

CC: Hoang Hong, Traffic Operations
Judy Tortelli, Traffic Operations

Reno Spaghetti Bowl – Traffic Forecasting Adjustments

To:	Judy Tortelli, Nevada Department of Transportation Mark Wooster, Nevada Department of Transportation Chris Wright, Nevada Department of Transportation Hoang Hong, Nevada Department of Transportation
FROM:	Jim Roldan, CH2M Loren Bloomberg, CH2M Chaitanya Paleti Siva Sai Krishna, CH2M
DATE:	May 23, 2017
PROJECT NUMBER:	684384

1. Introduction

The Nevada Department of Transportation (NDOT) and the Federal Highway Administration (FHWA), in cooperation with the Regional Transportation Commission of Washoe County (RTC) and the cities of Reno and Sparks, are studying alternatives to address the obsolete design, improve safety, and reduce travel delay in the Interstate 80 (I-80) and Interstate 580/U.S. Highway 395 (I-580/US 395) corridors and the interchange that connects these freeways (referred to as the Reno Spaghetti Bowl).

The Reno Spaghetti Bowl was originally constructed between 1969 and 1971 for a metropolitan population of about 130,000 people. The current population of Washoe County has increased to approximately 420,000 people, with a forecasted growth rate exceeding state and national averages. As the existing Reno Spaghetti Bowl nears its design capacity, NDOT and FHWA desire to complete the necessary National Environmental Policy Act of 1969 (NEPA) and design studies to determine appropriate measures to reconstruct the interchange to accommodate the future travel demands. CH2M is leading the effort to prepare the environmental document for the project. As part of this effort, a traffic operations technical study is being prepared.

The I-80/I-580system-to-system interchange, referred to as the Reno Spaghetti Bowl, is located in Washoe County, NV. The Project limits are as follows:

- I-80 Western Limits: Keystone Avenue interchange
- I-80 Eastern Limits: McCarran Boulevard interchange
- I-580/US 395 Northern Limits: Parr Avenue/Dandini Boulevard interchange
- I-580/US 395 Southern Limits: Meadowood Mall Way interchange

The study area includes a total of 16 service interchanges, one system-to-system interchange, braided/collector distributor systems, and multiple local roads (cross streets and frontages).

Future year forecasts were developed as part of the Reno/Sparks Traffic Study (prepared by C A Group in October, 2016 and approved by NDOT in December, 2016). The future year forecasts (2040) from the Reno/Sparks Traffic Study are being used as the starting point for the future year forecasts for the Reno Spaghetti Bowl Project Traffic Analysis. The future year (2040) forecasts from the Reno/Sparks Traffic Study are described as the "original forecasts" in this technical memorandum. The original forecasts were based on Washoe County Consensus Forecasts adopted by the Truckee Meadows Regional Planning Agency (TMRPA) in September, 2016. Since the original forecasts were prepared and approved, there have been some new developments:

- RTC has released their 2040 Regional Transportation Plan (RTP) model (adopted on May 18, 2017). The 2040 RTP was in production while the original forecasts were being developed. C A Group worked with RTC while preparing the original forecasts to include the then-current socio-economic data and planned network improvements. However, the adopted 2040 RTP regional travel demand model has newer information, so the forecasts used for the Reno Spaghetti Bowl Project Traffic Analysis needed updates to be consistent with the latest information available.
- Review of the original forecasts revealed that several movements through the Reno Spaghetti Bowl were lower in the 2040 projection than in existing conditions.

Both of the above items warranted further review and adjustment of the original forecasts before they were used in the Reno Spaghetti Bowl Project Traffic Analysis. The purpose of this memorandum is to document those traffic forecasting adjustments applied to the original forecasts.

2. 2040 Regional Transportation Plan Model Review

The 2040 RTP was adopted on May 18, 2017 by RTC and supporting regional/local agencies (including NDOT and FHWA). The 2040 RTP identifies the long-term transportation investments that will be made in the urbanized area of Reno, Sparks, and Washoe County, Nevada.

The 2040 RTP was in production while the original forecasts were being developed and approved in December, 2016. C A Group worked with RTC while preparing the original forecasts to include the socio-economic data and planned network improvements that were known at that time. However, there have been revisions since that model was developed. The planned network improvements in the 2040 RTP were compared against the network improvements used in the original forecast model. Table 2-1 lists summarizes the planned network improvement projects that were not included in the original forecast model but are included in the 2040 RTP. The majority of the projects listed in Table 2-1 are multimodal, bike lane, or arterial capacity projects that will have minimal (if any) effect on freeway traffic. Of the 61 projects listed in Table 2-1, only two of the projects (#54 and 55) are freeway projects that were left out of the original forecast model. Both of these freeway projects are on US 395, north of the study area and are not anticipated to have an impact on projected demand freeway on US 395 because there are no parallel routes to US 395 in this area. Therefore, traffic forecasted to enter/exit the north end of the study area will do so regardless of these two improvement projects because there is no alternative route.

TABLE 2-1
Network Improvement Projects in the 2040 RTP that are Not Included in the Original Forecast Model

	Project	Limits	Description	Type of Project	Planned Implementation
1	Arlington Ave	At Truckee River Bridge	Replace existing bridges (PE/NEPA)	Multimodal	2017-2021
2	2nd Street	Keystone Ave to I-580	Multimodal improvements (corridor study completed) Phase 1	Multimodal	2017-2021
3	Center Street	S Virginia to I-80	Widen sidewalks & add bike lanes	Multimodal	2017-2021
4	Forest Street	California Avenue to Mount Rose Street	Bike facility	Bike Lanes	2017-2021
5	Wingfield Hills Rd	Existing Wingfield Hills Rd west to David Allen Pkwy	New 4 lane road	Arterial Capacity	2017-2021
6	Pyramid Hwy/US 395 Connector Phase 1	Queen Way to Golden View	Widen Pyramid to 6 lanes from Queen Way to Golden View (PE/NEPA)	Arterial Capacity	2017-2021
7	Sierra Street	California Ave to 9th St	Widen sidewalks & add bike lanes	Multimodal	2017-2021
8	Vassar Street	Holcomb Avenue to Terminal Way	Bike lanes	Bike Lanes	2017-2021
9	Victorian Avenue	16th Street to Pyramid Way	Bike lanes	Bike Lanes	2017-2021
10	Vine Street	Riverside Drive to University Terrace	Bike lanes	Bike Lanes	2017-2021
11	Arlington Ave	At Truckee River Bridge	Replace existing bridges	Multimodal	2022-2026
12	Buck Dr	Lemmon Dr to N Hills Blvd	Widen 2 to 4 lanes	Arterial Capacity	2022-2026
13	N/S Connector Rd	Stonebrook Pkwy to Wingfield Hills Rd	New 2 lane road	Arterial Capacity	2022-2026
14	Military Rd	Lemmon Dr to Echo Ave	Widen 2 to 4 lanes	Arterial Capacity	2022-2026
15	Mill St/Terminal Way	Reno Tahoe International Airport to Lake St (downtown Reno)	Multimodal improvements; construction (corridor study complete)	Multimodal	2022-2026
16	Moya Blvd	Red Rock Rd to Echo Ave	Widen 2 to 4 lanes	Arterial Capacity	2022-2026

TABLE 2-1
Network Improvement Projects in the 2040 RTP that are Not Included in the Original Forecast Model

	Project	Limits	Description	Type of Project	Planned Implementation
17	Parr Blvd	Ferrari McLeod to Raggio Pkwy	Widen 2 to 4 lanes	Arterial Capacity	2022-2026
18	Sierra St	At Truckee River Bridge	Replace existing bridge	Multimodal	2022-2026
19	South Virginia Street	E Patriot Blvd to Mt. Rose Hwy/Geiger Grade	Add sidewalks and bike lane, convert travel lane to bus/bike lane	Multimodal	2022-2026
20	W 2nd Street (Reno)	Keystone Avenue to Galletti Way	Enhanced sidewalks, landscaping, bike lanes	Multimodal	2022-2026
21	Whitelake Parkway	Between US 395 ramp terminals	Widen 2 to 4 lanes	Arterial Capacity	2022-2026
22	4th Street (Reno)	Keystone Avenue to Evans Ave	Enhanced sidewalks and bike lanes, intersection improvements	Multimodal	2027-2040
23	4th Street (Sparks)	Victorian Avenue to Queen Way	Bike lanes	Bike Lanes	2027-2040
24	7th Street (Reno)	Stoker Avenue to Washington Street	Bike lanes	Bike Lanes	2027-2040
25	9th Street/G Street	Wells Avenue to El Rancho Drive	Enhanced sidewalks and bike lanes	Multimodal	2027-2040
26	9th Street/University Terrace (Reno)	Keystone Avenue to North Virginia Street	Sidewalks and bike lanes	Multimodal	2027-2040
27	Baring Boulevard	McCarran Boulevard to Vista Boulevard	Bike lanes	Bike Lanes	2027-2040
28	Disc Drive	Sparks Boulevard to Vista Boulevard	Enhanced sidewalks and bike lanes	Multimodal	2027-2040
29	Eagle Canyon Extension	Eagle Canyon to Lemmon Drive; Lemmon Drive to Military Rd	New 4 lane arterial	Arterial Capacity	2027-2040
30	Eastlake Boulevard	Old US 395 to I-580 Interchange	Bike lanes or multiuse path	Bike Lanes	2027-2040
31	El Rancho Drive/Dandini Boulevard	Raggio Parkway to Sullivan Lane	Multimodal improvements, including enhanced sidewalks & bike lanes	Multimodal	2027-2040
32	Enterprise Road	Evans Avenue to Valley Road	Enhanced sidewalk on north side of road	Multimodal	2027-2040

TABLE 2-1 (CONT)
Network Improvement Projects in the 2040 RTP that are Not Included in the Original Forecast Model

	Project	Limits	Description	Type of Project	Planned Implementation
33	Golden Valley Road	N Virginia Street to North Hills Boulevard	Bike lanes	Bike Lanes	2027-2040
34	Greg Street	Mill Street to Vista Boulevard	Sidewalks	Multimodal	2027-2040
35	Huffaker Lane	Bluestone Drive to Longley Lane	Bike lanes	Bike Lanes	2027-2040
36	I Street	Pyramid Way to 4th Street	Bike lanes	Bike Lanes	2027-2040
37	Keystone Ave	Coleman Drive to Peavine Road	Sidewalks and bike lanes	Multimodal	2027-2040
38	Kings Row	McCarran Boulevard to Keystone	Bike lanes	Bike Lanes	2027-2040
39	Lake St	At Truckee River Bridge	Replace existing bridge	Multimodal	2027-2040
40	Lakeside Drive	McCarran Boulevard to Plumb Lane	Bike lanes	Bike Lanes	2027-2040
41	Los Altos Parkway	Ion Court/Ion Drive to Vista Boulevard	Bike lanes	Bike Lanes	2027-2040
42	McCarran Boulevard	Greg Street to Prater Way	Sidewalks and bike lanes	Multimodal	2027-2040
43	Moana Lane	Plumas Street to Baker Lane	Sidewalks and bike lanes	Multimodal	2027-2040
44	Neil Road	McCarran Boulevard to Moana Lane	Bike lanes	Bike Lanes	2027-2040
45	Plumb Lane	Kietzke Lane to Terminal Way	Bike lanes	Bike Lanes	2027-2040
46	Prater Way	Pyramid Way to Pete's Way	Enhanced sidewalks and bike lanes, intersection improvements	Bike Lanes	2027-2040
47	Rock Boulevard	Greg Street to Glendale Avenue	Sidewalks and bike lanes	Multimodal	2027-2040
48	Rock Boulevard	Prater Way to McCarran Boulevard	Enhanced sidewalks and bike lanes	Multimodal	2027-2040

TABLE 2-1 (CONT)
Network Improvement Projects in the 2040 RTP that are Not Included in the Original Forecast Model

	Project	Limits	Description	Type of Project	Planned Implementation
49	Sadleir Way	Valley Road to Wells Avenue	Bike lanes	Bike Lanes	2027-2040
50	San Rafael Drive	Washington Street to N Sierra Street	Sidewalks and bike lanes	Multimodal	2027-2040
51	Silverada Boulevard	E 9th Street to Hiko Avenue	Bike lanes	Bike Lanes	2027-2040
52	Skyline Boulevard	Cashill Boulevard to Arlington Avenue	Bike lanes	Bike Lanes	2027-2040
53	Stanford Way	Victorian Avenue to Prater Way	Bike lanes	Bike Lanes	2027-2040
54	US 395*	N Virginia St to Golden Valley Rd	Additional lane in each direction	Freeway	2027-2040
55	US 395*	Golden Valley Rd to Stead Blvd	Additional lane in each direction	Freeway	2027-2040
56	Valley Road	Sadleir Way to Enterprise Road	Sidewalks and bike lanes	Multimodal	2027-2040
57	Vista Boulevard	Greg Street to S Los Altos Parkway	Sidewalks and bike lanes	Multimodal	2027-2040
58	Washington Street	Putnam Drive to W 2nd Street	Bike lanes	Bike Lanes	2027-2040
59	Wells Avenue	Moran Street to E 9th Street	Bike lanes and bike/pedestrian facilities over the Truckee River	Bike Lanes	2027-2040
60	Yori Avenue	Moana Lane to Plumb Lane	Sidewalks and bike lanes	Multimodal	2027-2040
61	Zolezzi Lane	S Virginia St to Thomas Creek Rd	Sidewalks	Multimodal	2027-2040

* Only two freeway projects not included in the original forecast model. Do not effect forecasts in the study area because improvements are north of the study area and there are no alternative routes for US 395 freeway demand that wants to travel through the study area. Therefore, forecasts on US 395 in the study area are not affected.

RTC provided the 2040 RTP travel demand model for review in April, 2017. CH2M reviewed and compared the 2040 RTP model with the 2040 model used to prepare the original forecasts as part of the Reno/Sparks Traffic Study. **Exhibits 2-1** through **2-3** illustrate the differences in demand between the 2040 RTP model and the original 2040 model for the AM, PM, and daily periods. Review of the comparison exhibits shows the following:

- The 2040 RTP model has several planned improvements that are not in the original forecast model. However, these network differences are located away from the freeway network (e.g., complete street projects).
- The 2040 RTP model is coded the same as the original forecast model along the freeway system in the study area. It is important to note the 2040 RTP model has the US 395/Sutro Street interchange in it in 2040. The original forecast model also has the US 395/Sutro Street interchange in it.
- For the AM peak period, the original forecast model is within 10% of the 2040 RTP model for the majority of the freeway corridors in the study area. For the handful of locations where the differences are greater than 10%, the original forecast model is generally higher, and within 20% of the 2040 RTP model. The one area where the 2040 RTP model is a bit higher is in the area of the US 395/Sutro Street interchange (14%).
- For the PM peak period, the original forecast model is within 10% of the 2040 RTP model for the majority of the freeway corridors in the study area. For the handful of areas where the differences are greater than 10%, the original forecast model is generally higher within 25% of the 2040 RTP model. . The one area where the 2040 RTP model is a bit higher is in the area of the US 395/Sutro Street interchange (12%).
- For the daily projections, the original forecast model is within 10% of the 2040 RTP model throughout a majority of the freeway corridors in the study area. For the handful of areas where the differences are greater than 10%, the original forecast model is generally higher and within 13% of the 2040 RTP model.

Based on the comparison summary listed above, the conclusion is that the original forecasts are consistent with the 2040 RTP model and do not need to be adjusted beyond the adjustments listed in the following sections.

3. Adjustments to System Ramp Forecasts

The original forecasts were examined to ensure the projected growth in the study area is consistent with trends projected by socio-economic growth and planned network improvements. In particular, the system ramp movements at the Reno Spaghetti Bowl were closely examined to ensure the growth between existing conditions and 2040 make sense considering projects like the Southeast Connector. A focus area were those freeway-to-freeway movements where 2040 volumes are lower than existing conditions.

Table 3-1 is a summary of the changes in volumes (existing to 2040) in the original model for the movements through the Reno Spaghetti Bowl. **Exhibit 3-1** is a screenshot of the Reno Spaghetti Bowl interchange with labels for various traffic movements for reference.

EXHIBIT 2-1
Travel Demand Model Comparison - 2040 RTP Model vs. 2040 Original Forecast Model (AM Peak Period, 7-9 AM)

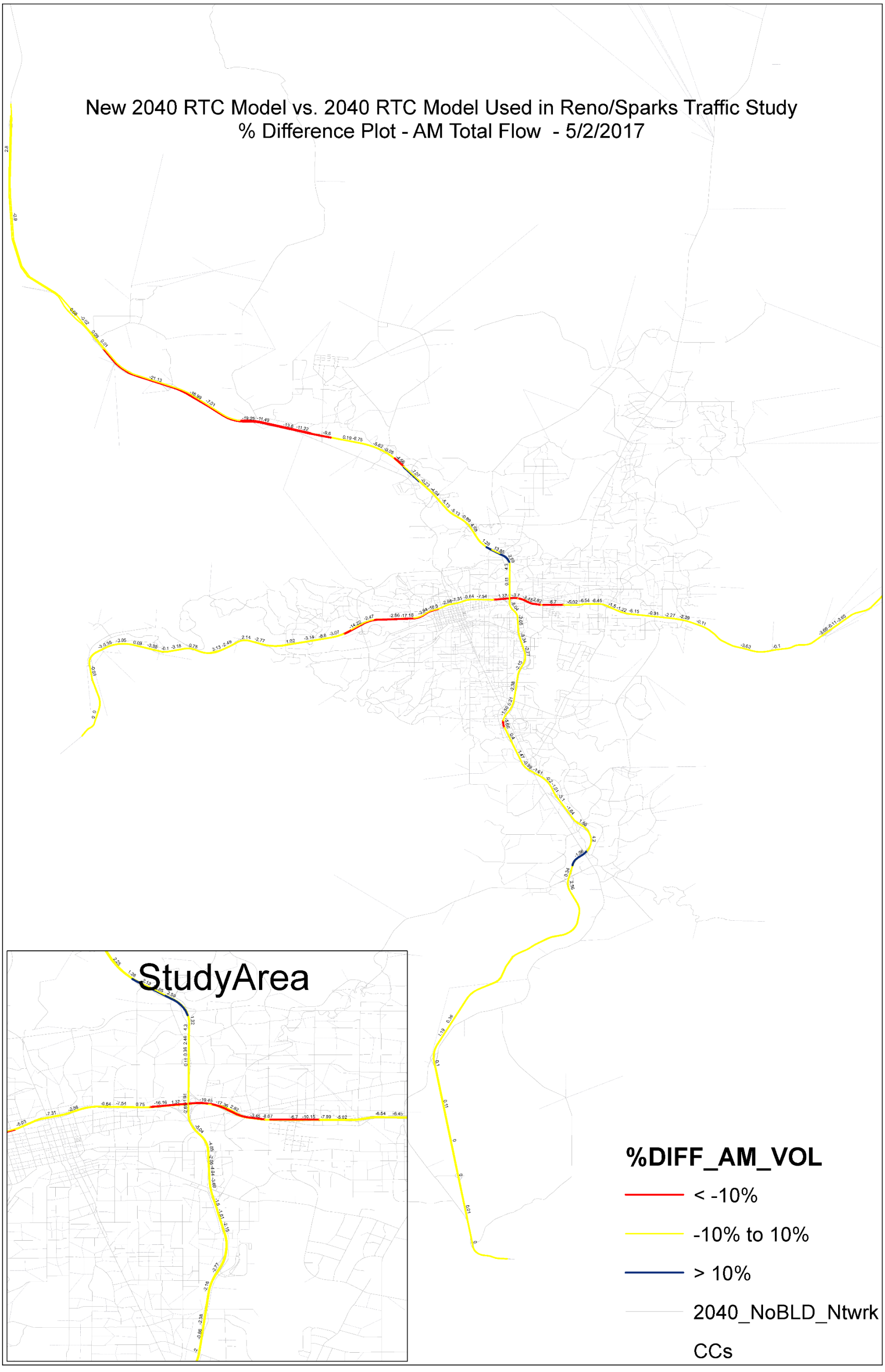


EXHIBIT 2-2
Travel Demand Model Comparison - 2040 RTP Model vs. 2040 Original Forecast Model (PM Peak Period, 4-6 PM)

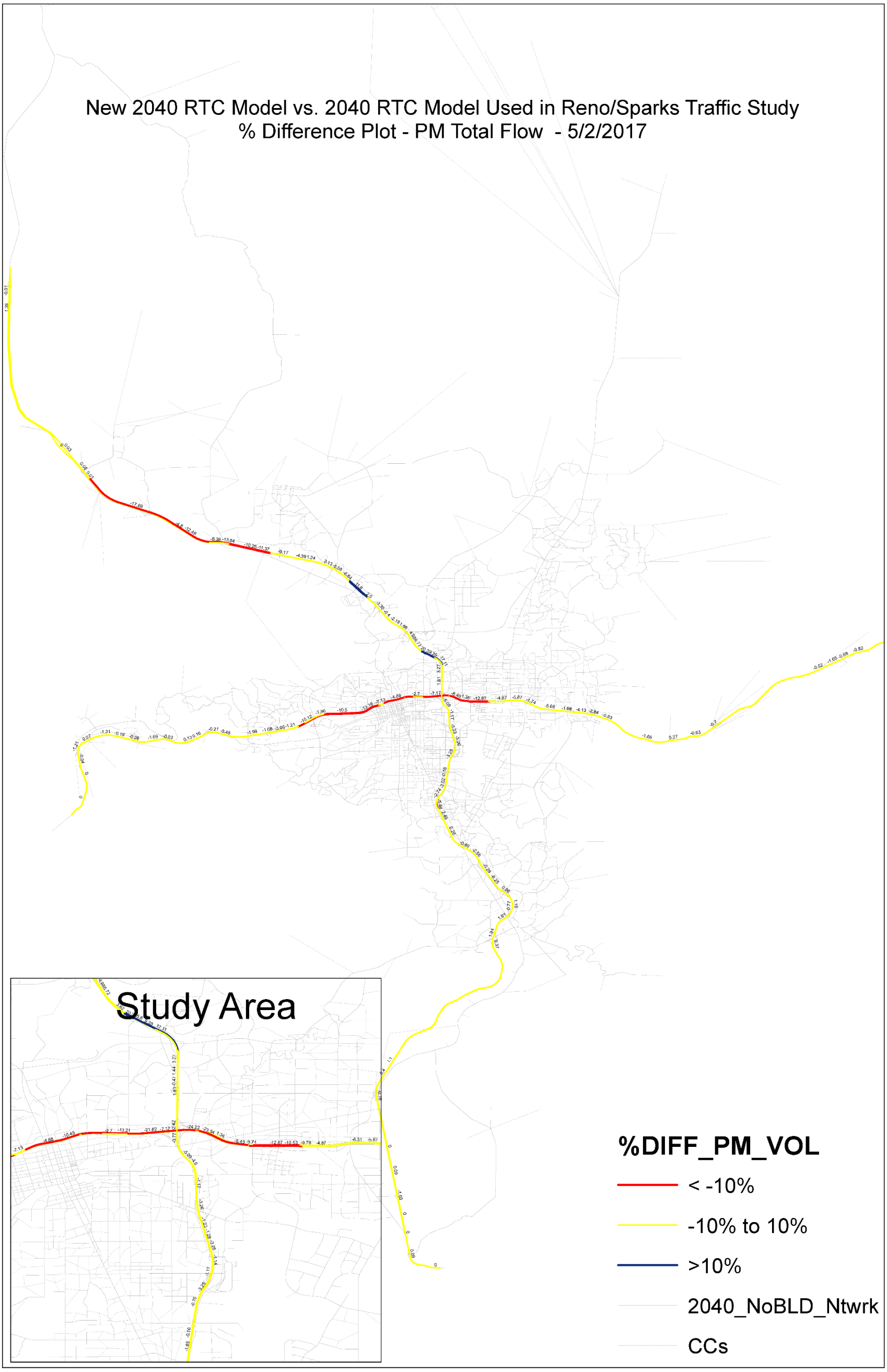


EXHIBIT 2-3
Travel Demand Model Comparison - 2040 RTP Model vs. 2040 Original Forecast Model (Daily Traffic)

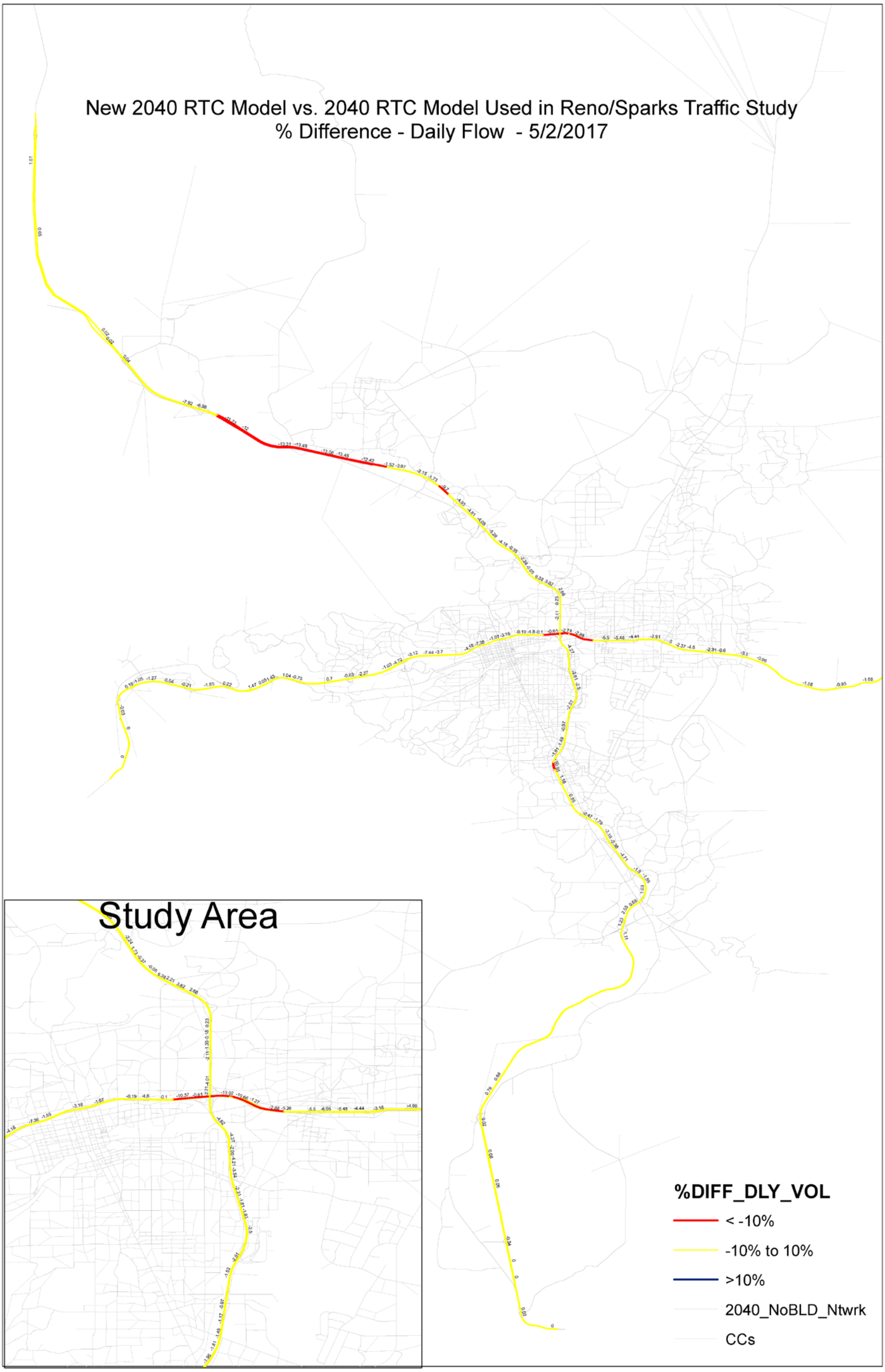
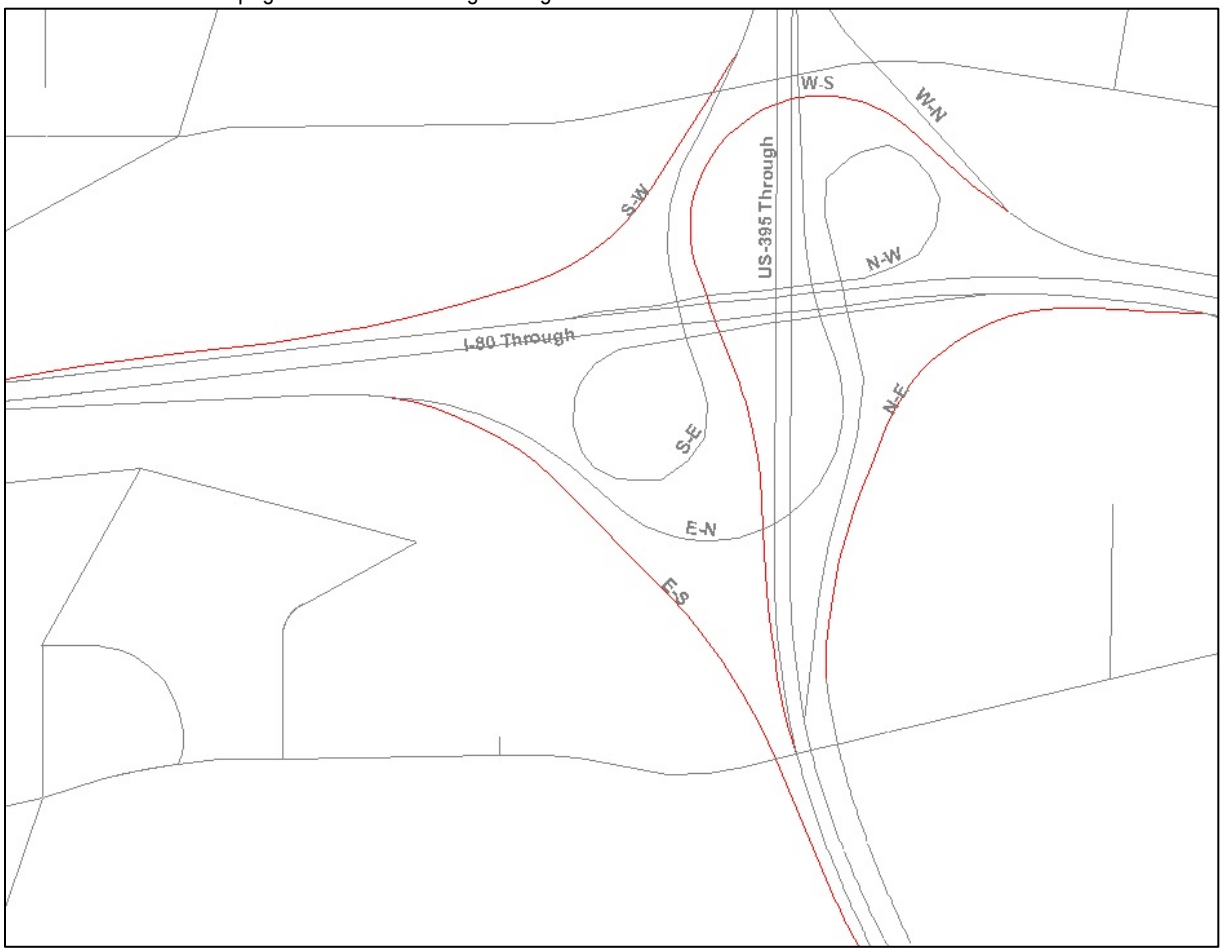


TABLE 3-1
Change in Volumes (2015 – 2040)at the Reno Spaghetti Bowl Interchange, Original Forecast Model

Traffic Movements through RSB	Original Forecast Model – 2015 to 2040		
	AM Peak	PM Peak	Daily Totals
US 395/I-580 through	39%	38%	45%
I-80 through	17%	26%	15%
N-E	-13%	-9%	-2%
N-W	18%	11%	12%
S-E	65%	52%	60%
S-W	-14%	0%	28%
E-N	44%	8%	47%
E-S	-1%	-2%	4%
W-N	45%	31%	48%
W-S	-30%	-30%	-13%

Note: Red text indicates movement with negative growth rate in one or more time periods (AM peak, PM peak, daily) and therefore subject to further review/adjustment.

EXHIBIT 3-1
Screenshot of the Reno Spaghetti Bowl Interchange - Original Forecast Model



As shown in the **Table 3-1**, the following four system ramps are projected to decrease in demand between existing conditions and 2040 using the original forecasts:

- Northbound I-580/US 395 to eastbound I-80
- Southbound I-580/US 395 to westbound I-80
- Eastbound I-80 to southbound I-580/US 395
- Westbound I-80 to southbound I-580/US 395

Further analysis of the traffic demands in the original forecast model shows that the arterials surrounding the Reno Spaghetti Bowl Interchange are projected to increase in demand at a higher rate than adjacent arterials that are not bypass routes around the Reno Spaghetti Bowl. This observation suggests that the negative growth rates for the movements listed above could be due to the following model capacity constraints:

- *Northbound I-580/US 395 to eastbound I-80:* two-lane ramp that merges down to one lane before joining I-80; demand exceeds capacity for one-lane ramp.
- *Southbound I-580/US 395 to westbound I-80:* demand exceeds capacity for one-lane ramp.
- *Eastbound I-80 to southbound I-580/US 395:* two-lane ramp that merges down to one lane before joining I-580; demand exceeds capacity for one-lane ramp.
- *Westbound I-80 to southbound I-580/US 395:* demand exceeds capacity for one-lane ramp.

Because of these capacity constraints, the original forecast model appears to have assigned trips to arterial routes, because it calculates the arterial route as the shortest path. While this assignment is consistent with the travel demand model, it may not reflect reality since most drivers would prefer to wait in congested conditions through the system interchange, rather than navigate through arterial bypass routes with traffic signals at every cross street. To test this theory, the project team ran a revised 2040 model with increased capacity on the four system ramps in question (N-E, S-W, E-S, and W-S). In the "unconstrained" system ramp model run, the capacities of each of the four system ramps were increased by adding a second lane.

Table 3-2 is a summary of the changes in volumes (existing to 2040) from the unconstrained model for movements through the Reno Spaghetti Bowl.

TABLE 3-2
Changes in Volumes (2015 – 2040) at the Reno Spaghetti Bowl Interchange, Unconstrained Forecast Model

Traffic Movements through RSB	Unconstrained Model – Growth Rates		
	AM Peak	PM Peak	Daily Totals
US 395-I-580 through	39%	38%	45%
I-80 through	17%	26%	15%
N-E	-12%	2%	-3%
N-W	18%	11%	12%
S-E	65%	52%	60%
S-W	21%	28%	45%
E-N	44%	8%	47%
E-S	13%	13%	10%
W-N	45%	31%	48%
W-S	-34%	-30%	-17%

Note: Green text indicates movement with revised positive growth rate based on unconstrained model run.
Blue text indicates movement with validated negative growth rate based on unconstrained model run. Negative growth rate due to the travel shift to the Southeast Connector.

Review of Table 3-2 shows the following:

- *Northbound I-580/US 395 to eastbound I-80:* The reduction in volume between existing conditions and 2040 is validated. The decrease in demand is largely due to the addition of the Southeast Connector project (i.e., traffic will shift to the Southeast Connector, reducing volume on the connector).
- *Southbound I-580/US 395 to westbound I-80:* The unconstrained model results in an increase in volumes between existing conditions and 2040. This result is consistent with expectations, since freeway traffic is more likely to stay on the freeway rather than use arterial bypass routes with traffic signals.
- *Eastbound I-80 to southbound I-580/US 395:* The unconstrained model results in an increase growth between existing conditions and 2040. This results is consistent with expectations since freeway traffic is more likely to stay on the freeway rather than use arterial bypass routes with traffic signals.
- *Westbound I-80 to southbound I-580/US 395:* The reduction in volume between existing conditions and 2040 is validated. The decrease in demand is largely due to the addition of the Southeast Connector project, reducing volume on the connector.

Based on the findings of the unconstrained model run, the following adjustments to the original forecasts will be made and used in the Reno Spaghetti Bowl Traffic Analysis:

- *Northbound I-580/US 395 to eastbound I-80:* No adjustment will be made for this movement. The analysis will use the original forecast for this movement.
- *Southbound I-580/US 395 to westbound I-80:* Traffic forecasts will be adjusted to reflect the following increases in volumes between existing conditions and 2040: +21% in the AM peak, +28% in the PM peak, and +45% on a daily basis. The adjusted traffic volumes will be captured as an end-to-end movement in the study area (i.e., entering southbound US

395 at the north end of the study area, travelling through the S-W ramp, and exiting the study area on westbound I-80).

- *Eastbound I-80 to southbound I-580/US 395:* Traffic forecasts will be adjusted to reflect the following increase in volumes between existing conditions and 2040: +13% in the AM peak, +13% in the PM peak, and +10% on a daily basis. The adjusted traffic volumes will be captured as an end-to-end movement in the study area (i.e., entering eastbound I-80 at the west end of the study area, travelling through the E-S ramp, and exiting the study area on southbound I-580).
- *Westbound I-80 to southbound I-580/US 395:* No adjustment will be made for this movement. The analysis will use the original forecast for this movement.

These adjustments were discussed with NDOT and FHWA in April 2017 during the bi-weekly traffic team calls. Both NDOT and FHWA concurred with the proposed adjustments. **Attachment A** provides exhibits showing the existing and adjusted 2040 traffic demands to be used in the analysis (one-hour peak hour demands and two-hour peak period demands).

4. No-Build Network for the Reno Spaghetti Bowl Project

The original travel demand model was also reviewed to ensure the network reflected the true no-build condition. Upon review it was discovered that four locations included elements of the Reno Spaghetti Bowl project and therefore did not represent the true no-build conditions. The four locations and the associated improvements are listed below:

- Northbound US 395 between Sutro Street and McCarran Boulevard: The original model network included four general purpose lanes. The no-build condition should only have three general purpose lanes.
- Southbound US 395 between Sutro Street and McCarran Boulevard: The original model network included four general purpose lanes. The no-build condition should only have two general purpose lanes.
- Northbound/Southbound US 395 between McCarran Boulevard and I-80: The original model network included four general purpose lanes. The no-build condition should only have three general purpose lanes.
- Eastbound/Westbound I-80 at Pyramid Way: The original model network included three general purpose lanes. The no-build condition should only have two general purpose lanes.

Exhibit 4-1 illustrates the locations of these no-build network discrepancies in the original model.

Once these network discrepancies were identified, it was necessary to determine what effect correcting them would have on the original forecasts. To do so, the original model was modified to correct the discrepancies identified in Exhibit 4-1. These corrections modified the 2040 lane configuration for US 395/I-580 and the I-80 corridors in the study area so that they matched with existing conditions and thus represent the true no-build condition.

Once the network changes were made, the true no-build model was ran to generate revised 2040 forecasts. **Exhibit 4-2** illustrates the percent difference in total daily demand between the 2040 original forecast model and the true 2040 no-build model. Review of Exhibit 4-2 shows that traffic

demand on all freeway links is relatively the same (within 10%) between the original forecast model and the true no-build model. The one location where volume differences were found to be greater than 10% was along southbound US 395 between Sutro Street and Oddie Boulevard.

Tables 4-1 and **4-2** summarize the daily and peak period flows for the 2040 original forecast model and true no-build model runs. The links presented in these tables are those for which the number of lanes in the true no-build model were changed to match existing conditions.

EXHIBIT 4-1
No-Build Network Discrepancies in Original Forecast Model

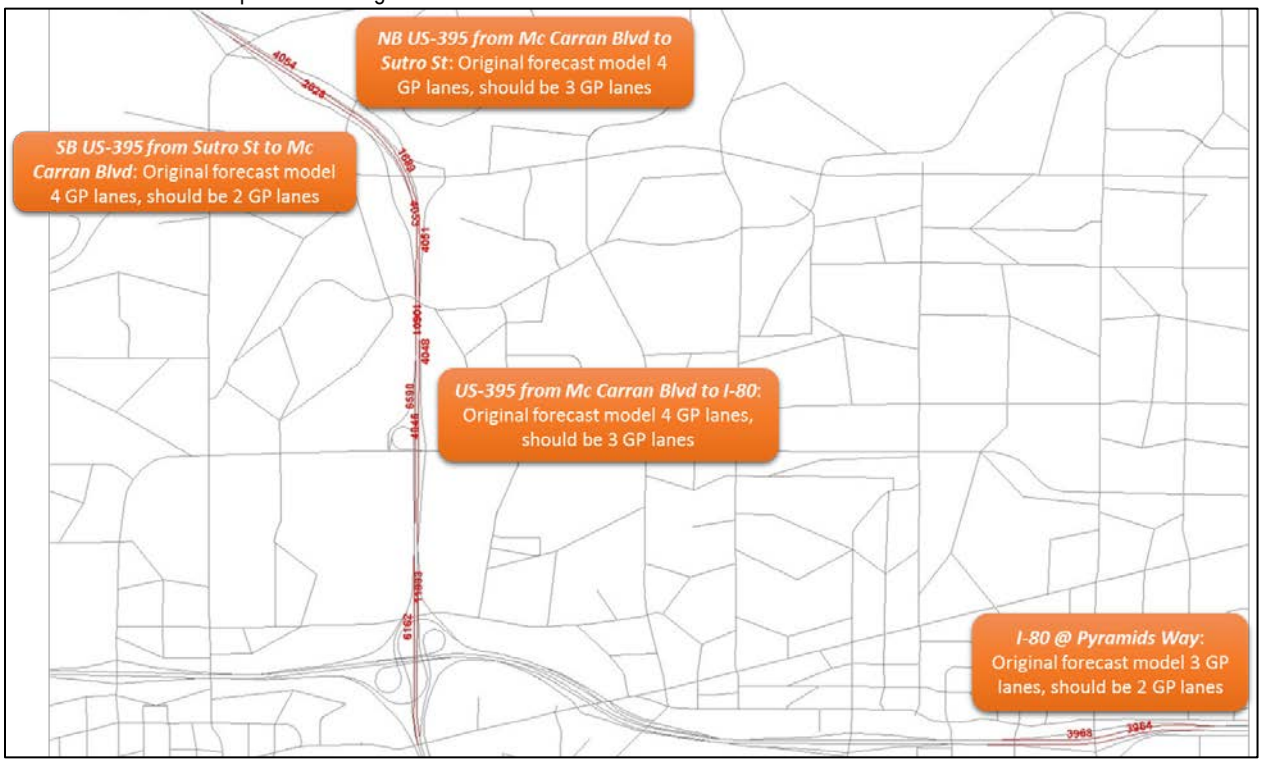


EXHIBIT 4-2
Percent Difference in Total Daily Demand between the Original 2040 Forecast Model and the True 2040 No-Build Model

TABLE 4-1
Daily Traffic Demand Comparison between the 2040 True No-Build and the 2040 Original Forecast

Link ID	Link Location	Daily Traffic Demand		
		2040 True No-Build	2040 Original Forecast	% Difference
1689	NB US-395	58,259	62,733	-7.13%
2628	SB US-395	48,456	61,521	-21.24%
3964	EB I-80	44,156	48,228	-8.44%
3968	WB I-80	42,930	46,466	-7.61%
4046	NB US-395	72,313	79,778	-9.36%
4048	NB US-395	82,901	87,842	-5.63%
4051	NB US-395	71,288	76,059	-6.27%
4053	SB US-395	57,434	73,478	-21.84%
4054	NB US-395	64,256	67,734	-5.13%
6162	SB US-395	51,567	55,248	-6.66%
6590	SB US-395	68,556	75,244	-8.89%
10601	SB US-395	74,987	83,951	-10.68%
11565	SB US-395	48,456	61,521	-21.24%
11833	NB US-395	51,402	54,146	-5.07%

TABLE 4-2
Peak Period Traffic Demand Comparison between the 2040 True No-Build and the 2040 Original Forecast

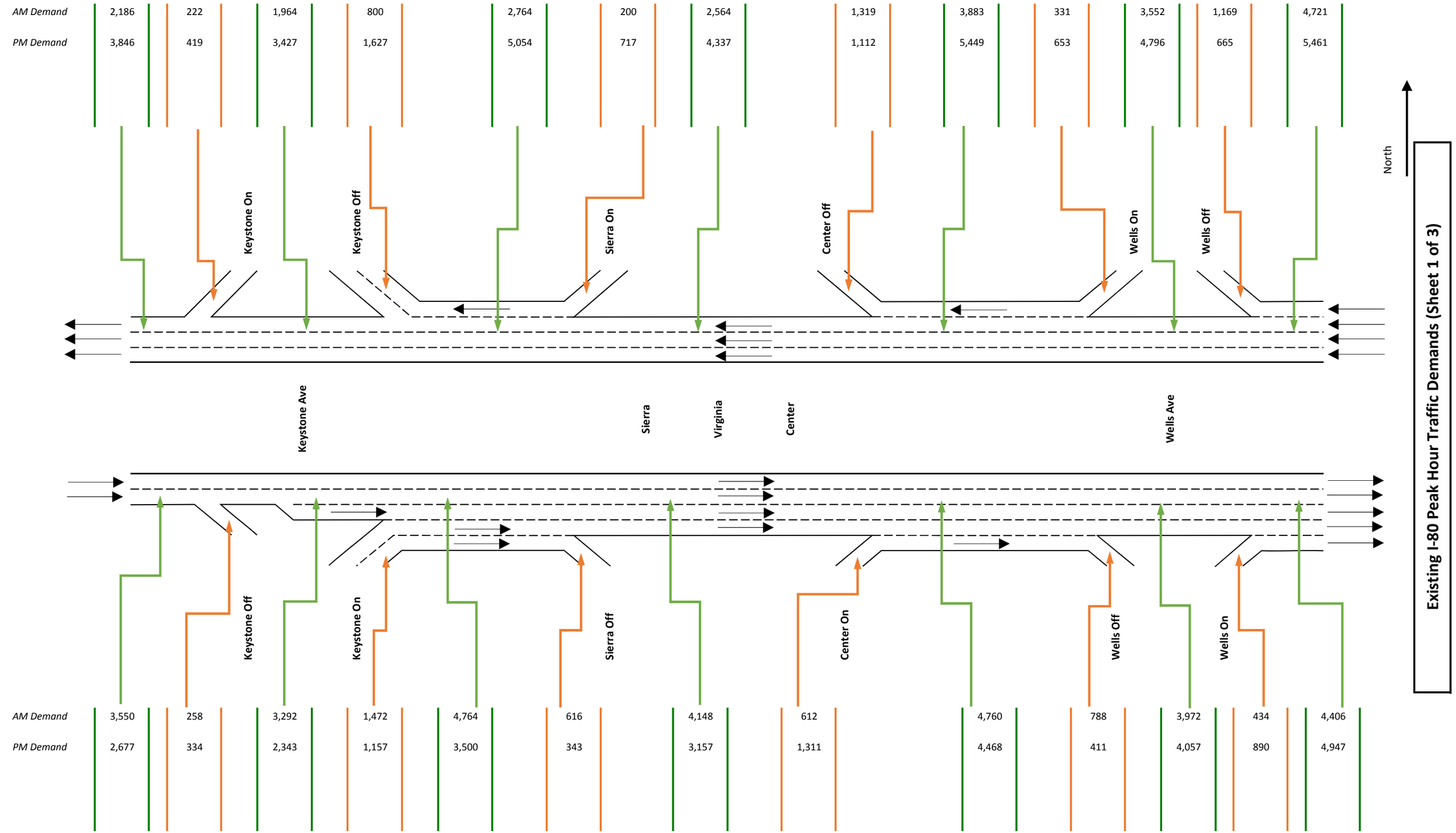
Link ID	Link Location	AM PEAK			PM PEAK		
		2040 True No-Build	2040 Original Forecast	% Diff.	2040 True No-Build	2040 Original Forecast	% Diff.
1689	NB US-395	7,087	7,235	-2.05%	9,538	12,621	-24.43%
2628	SB US-395	8,650	13,327	-35.10%	6,804	9,624	-29.31%
3964	EB I-80	6,747	7,324	-7.88%	7,254	9,344	-22.36%
3968	WB I-80	7,543	8,286	-8.96%	7,123	8,501	-16.21%
4046	NB US-395	8,816	9,155	-3.70%	12,458	15,525	-19.76%
4048	NB US-395	9,807	10,083	-2.74%	15,237	18,400	-17.19%
4051	NB US-395	8,133	8,320	-2.25%	12,564	15,673	-19.84%
4053	SB US-395	9,876	15,006	-34.19%	7,961	11,670	-31.78%
4054	NB US-395	7,780	7,908	-1.62%	12,291	14,431	-14.83%
6162	SB US-395	10,882	12,576	-13.47%	8,579	9,491	-9.61%
6590	SB US-395	12,165	15,205	-19.99%	10,199	11,840	-13.86%
0601	SB US-395	13,689	17,801	-23.10%	11,132	13,531	-17.74%
11565	SB US-395	8,650	13,327	-35.10%	6,804	9,624	-29.31%
11833	NB US-395	6,352	6,389	-0.57%	11,049	12,782	-13.56%

As summarized in Tables 4-1 and 4-2, the differences between the original forecast model and the true no-build model run are relatively minor with the exception of the southbound US 395 segment between Sutro Street and Oddie Boulevard. On this segment, the true no-build model run shows that the original forecasts are somewhat higher. However, the project team agreed that this one segment did not warrant further revisions to the original forecasts since the error was conservative (i.e., used a higher forecast). In addition, the original forecasts show that the additional demand will use that segment if more capacity is provided. Since the build scenario will add capacity in this segment and the forecast will also be used in the build condition, it is appropriate to use the higher demand value. The decision to make no further adjustments to the original forecasts beyond what was discussed in Section 3 of this memorandum was discussed with NDOT and FHWA in April 2017 during bi-weekly traffic team calls. Both NDOT and FHWA concurred with the decision of the project team.

Attachment A provides the final set of exhibits showing the 2040 traffic forecasts to be used in the Reno Spaghetti Bowl Traffic Analysis.

Attachment A
2040 Traffic Forecasts, Reno Spaghetti Bowl Traffic Analysis

Peak Hour (one-hour)


AM Demand
PM Demand
2,186
3,846
222
419
1,964
3,427
800
1,627
2,764
5,054
200
717
2,564
4,337
1,319
1,112
3,883
5,449
331
653
3,552
4,796
1,169
665
4,721
5,461
Keystone On
Keystone Off
Sierra On
Center Off
Wells On
Wells Off
North
Keystone Ave
Sierra
Virginia
Center
Wells Ave
Keystone Off
Keystone On
Sierra Off
Center On
Wells Off
Wells On
AM Demand
PM Demand
3,550
2,677
258
334
3,292
2,343
1,472
1,157
4,764
3,500
616
343
4,148
3,157
612
1,311
4,760
4,468
788
411
3,972
4,057
434
890
4,406
4,947
Existing I-80 Peak Hour Traffic Demands (Sheet 1 of 3)

Existing I-80 Peak Hour Traffic Demands (Sheet 2 of 3)

North

AM Demand	4,721	701	4,020	1,563	2,457	122	2,335	2,565	4,900	241	5,141
PM Demand	5,461	694	4,767	2,349	2,418	189	2,229	2,838	5,067	165	5,232

395 S to 80 W

580 N to 80 W

80 W to 395 N/580 S

Kietzke to 395 N

Prater On

Kietzke On

Prater Off

Wells Ave

Reno Spaghetti Bowl Interchange

Prater Wy

Kietzke Ln

80 E to 580 S/395 N

395 S to 80 E Loop

580 N to 80 E

Prater Off

Prater ON

AM Demand	4,406	2,475	1,931	1,008	2,939	1,279	4,218	357	3,861	152	4,013
PM Demand	4,947	2,731	2,216	772	2,988	2,461	5,449	340	5,109	277	5,386

Existing I-80 Peak Hour Traffic Demands (Sheet 3 of 3)

North

	Prater Wy		Rock Blvd		Nugget Viaduct		Pyramid Pkwy		McCarran Blvd			
AM Demand	5,141	431	4,710	383	5,093	1,082	4,011	78	4,089	538	3,551	
PM Demand	5,232	858	4,374	274	4,648	907	3,741	206	3,947	493	3,454	

Rock On | Rock Off | Pyramid On | Pyramid Off | McCarran On | McCarran NB Loop On | McCarran Off

AM Demand	4,013	692	3,321	126	3,447	599	2,848	184	3,032	953	2,079	
PM Demand	5,386	439	4,947	329	5,276	1,322	3,954	210	4,164	877	3,287	

Rock Off | Rock On | Pyramid Off | Pyramid On | McCarran Off | McCarran On

I-80-Prater to McCarran
RSB_DemandFigures_withadjustments_v4.xlsx

5/22/2017

Existing I-580/US 395 Peak Hour Traffic Demands (Sheet 1 of 3)

North

AM Demand	5,712	435	6,147	341	5,806	1,220	7,026	578	6,448	233	6,681	733	7,414
PM Demand	4,508	570	5,078	500	4,578	1,374	5,952	890	5,062	83	5,145	770	5,915

Meadowood Off
Kietzke Off
Virginia Off
Moana On
Moana Off
Plumb On
Airport Off
Villanova Off

Meadowood Mall Wy
Virginia St
Moana Ln
Plumb Ln
Villanova Dr

Meadowood On
Virginia On
Moana Off
Moana On
Plumb Off
Airport On
Villanova On

AM Demand	4,481	494	4,975	439	4,536	848	5,384	869	4,515	54	4,569	550	5,119
PM Demand	5,362	985	6,347	434	5,913	1,621	7,534	769	6,765	128	6,893	1,278	8,171

Existing I-580/US 395 Peak Hour Traffic Demands (Sheet 2 of 3)

North

AM Demand	7,414	401	7,013	1,067	8,080	285	7,795	475	8,270	1,977	6,293	1,944	4,349
PM Demand	5,915	823	5,092	716	5,808	622	5,186	395	5,581	1,843	3,738	1,495	2,243

Mill On | Mill Off | Glendale On | Glendale Off | 80 E to 580 S | 80 W to 580 S

to Villanova Dr | Mill St | Glendale Ave

Reno Spaghetti Bowl Interchange

Mill Off | Mill Loop On | Glendale Off | Glendale Loop On | 580 N to 80 E | 580 N to 80 W

AM Demand	5,119	1,048	4,071	359	4,430	439	3,991	209	4,200	1,279	2,921	1,563	1,358
PM Demand	8,171	464	7,707	998	8,705	246	8,459	530	8,989	2,461	6,528	2,349	4,179

Existing I-580/US 395 Peak Hour Traffic Demands (Sheet 3 of 3)

North

AM Demand	4,349	1,709	6,058	525	5,533	182	5,715	1,392	4,323	1,025	3,298	449	3,747					
PM Demand	2,243	1,466	3,709	436	3,273	218	3,491	852	2,639	543	2,096	488	2,584					

395 S to 80 W/ 80 E | Oddie On | Oddie Off | McCarran On | Clear Acre On | Clear Acre Off

Reno Spaghetti Bowl Interchange

Oddie Blvd | McCarran Blvd | Clear Acre Ln

80 E to 395 N | 80 W to 395 N | Oddie Off | Oddie On | McCarran Off | Clear Acre Off | McCarran On | Clear Acre On

AM Demand	1,358	498	1,856	621	2,477	303	2,174	184	2,358	498	1,860	281	1,579	236	1,815	79	1,894	
PM Demand	4,179	888	5,067	1,343	6,410	615	5,795	361	6,156	1,178	4,978	1,065	3,913	551	4,464	179	4,643	

2040 I-80 Peak Hour Traffic Demands (Sheet 1 of 3)

North

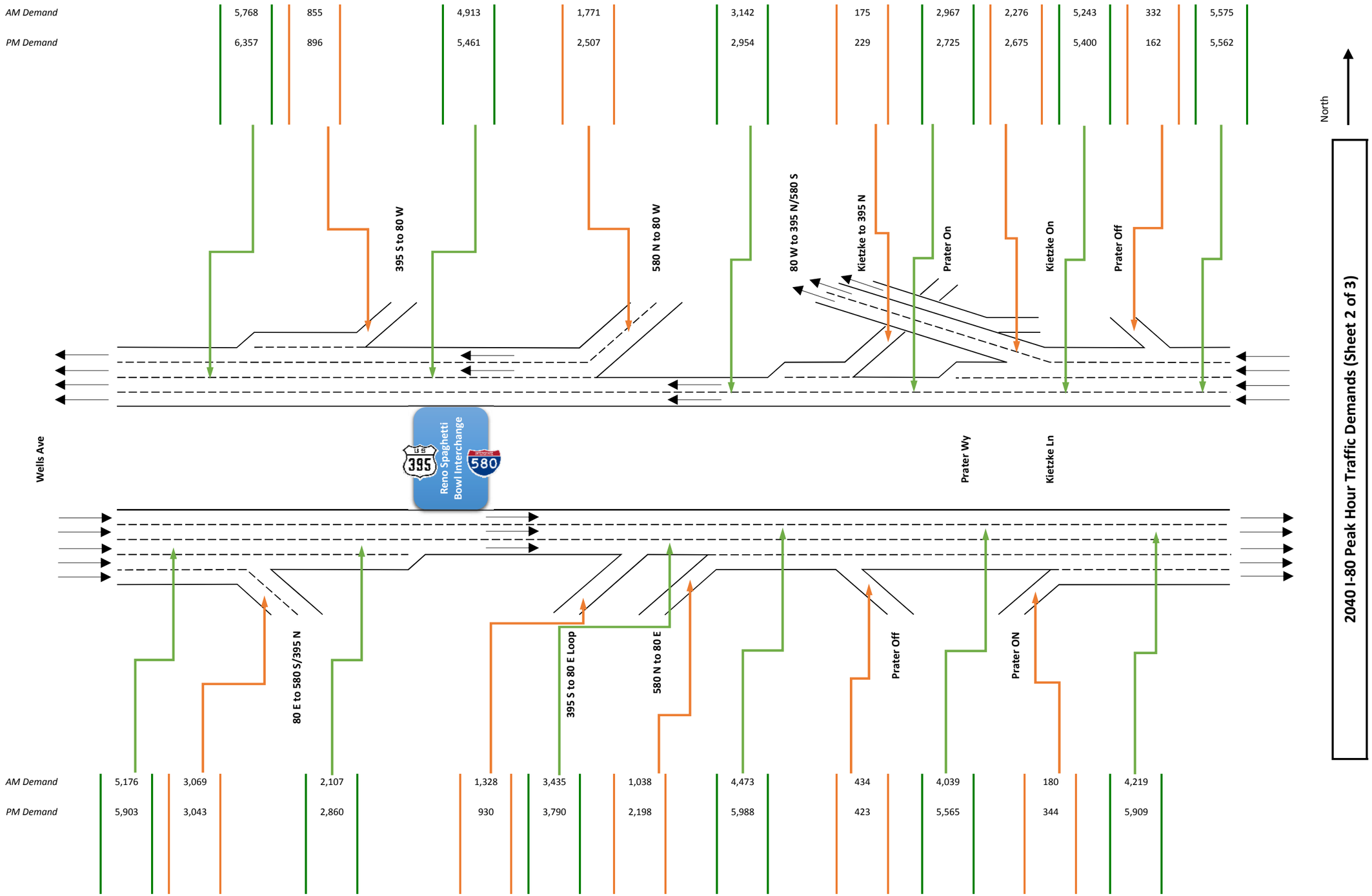
AM Demand	2,938	210	2,728	1,037	3,765	240	3,525	1,433	4,958	455	4,503	1,265	5,768
PM Demand	4,508	472	4,036	1,740	5,776	869	4,907	1,263	6,170	774	5,396	961	6,357

Keystone On
Keystone Off
Sierra On
Center Off
Wells On
Wells Off

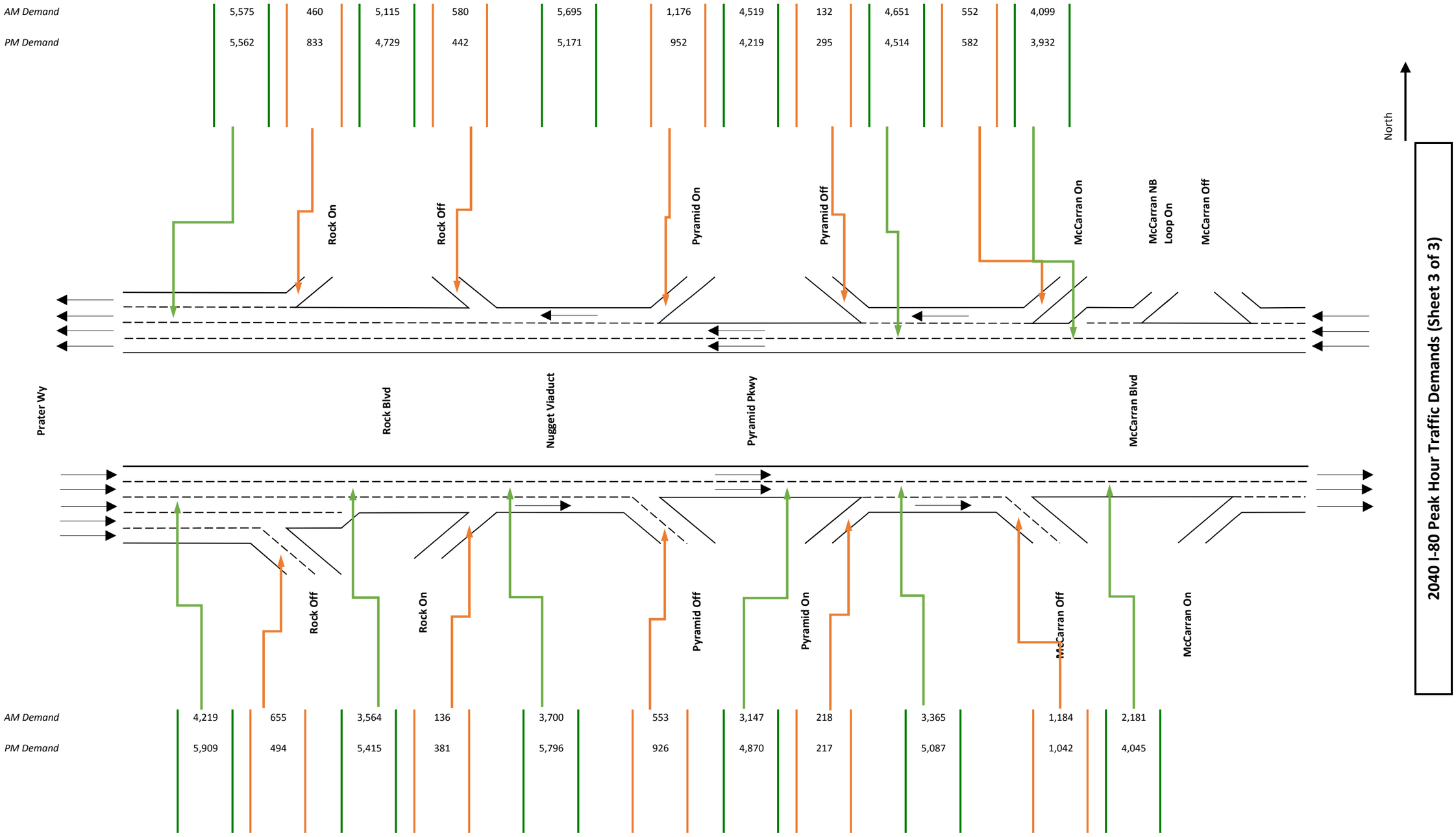
Keystone Ave
Sierra
Virginia
Center
Wells Ave

Keystone Off
Keystone On
Sierra Off
Center On
Wells Off
Wells On

AM Demand	4,787	384	4,403	1,399	5,802	1,071	4,731	779	5,510	884	4,626	550	5,176
PM Demand	3,497	404	3,093	1,270	4,363	512	3,851	1,495	5,346	508	4,838	1,065	5,903


AM Demand
PM Demand
5,768
6,357
855
896
4,913
5,461
1,771
2,507
3,142
2,954
175
229
2,967
2,725
2,276
2,675
5,243
5,400
332
162
5,575
5,562
395 S to 80 W
580 N to 80 W
80 W to 395 N/580 S
Kietzke to 395 N
Prater On
Kietzke On
Prater Off
North
2040 I-80 Peak Hour Traffic Demands (Sheet 2 of 3)
Wells Ave
Reno Spaghetti Bowl Interchange
Prater Wy
Kietzke Ln
80 E to 580 S/395 N
395 S to 80 E Loop
580 N to 80 E
Prater Off
Prater ON
AM Demand
PM Demand
5,176
5,903
3,069
3,043
2,107
2,860
1,328
930
3,435
3,790
1,038
2,198
4,473
5,988
434
423
4,039
5,565
180
344
4,219
5,909

2040 I-80 Peak Hour Traffic Demands (Sheet 3 of 3)



2040 I-580/US 395 Peak Hour Traffic Demands (Sheet 1 of 3)

North

AM Demand	5,883	518	6,401	385	6,016	1,452	7,468	634	6,834	249	7,083	801	7,884
PM Demand	4,727	598	5,325	538	4,787	1,630	6,417	964	5,453	90	5,543	988	6,531

Meadowood Off
Kietzke Off
Virginia Off
Moana On
Moana Off
Plumb On
Airport Off
Villanova Off

Meadowood Mall Wy
Virginia St
Moana Ln
Plumb Ln
Villanova Dr

Meadowood On
Virginia On
Moana Off
Moana On
Plumb Off
Airport On
Villanova On

AM Demand	4,553	523	5,076	452	4,624	1,073	5,697	921	4,776	54	4,830	602	5,432
PM Demand	5,556	995	6,551	518	6,033	1,830	7,863	839	7,024	206	7,230	1,405	8,635

2040 I-580/US 395 Peak Hour Traffic Demands (Sheet 2 of 3)

North

AM Demand	7,884	410	7,474	1,357	8,831	300	8,531	820	9,351	2,246	7,105	1,452	5,653
PM Demand	6,531	901	5,630	898	6,528	642	5,886	745	6,631	2,081	4,550	1,114	3,436

Mill On

Mill Off

Glendale On

Glendale Off

80 E to 580 S

80 W to 580 S

to Villanova Dr

Mill St

Glendale Ave

Reno Spaghetti Bowl Interchange

80

Mill Off

Mill Loop On

Glendale Off

Glendale Loop On

580 N to 80 E

580 N to 80 W

AM Demand	5,432	1,005	4,427	379	4,806	501	4,305	253	4,558	1,038	3,520	1,771	1,749
PM Demand	8,635	306	8,329	1,123	9,452	267	9,185	666	9,851	2,198	7,653	2,507	5,146

2040 I-580/US 395 Peak Hour Traffic Demands (Sheet 3 of 3)

North

AM Demand	5,653	2,183	7,836	500	7,336	557	7,893	1,249	6,644	993	5,651	136	5,787	1,316	7,103					
PM Demand	3,436	1,826	5,262	410	4,852	404	5,256	767	4,489	568	3,921	177	4,098	955	5,053					

395 S to 80 W/ 80 E | Oddie On | Oddie Off | McCarran On | Clear Acre On | Clear Acre Off | Sutro Off

Reno Spaghetti Bowl Interchange

Oddie Blvd | McCarran Blvd | Clear Acre Ln | Sutro St

80 E to 395 N | 80 W to 395 N | Oddie Off | Oddie On | McCarran Off | Clear Acre Off | McCarran On | Clear Acre On/ Sutro On

AM Demand	1,749	823	2,572	824	3,396	311	3,085	252	3,337	446	2,891	251	2,640	210	2,850	388	3,238			
PM Demand	5,146	962	6,108	1,561	7,669	670	6,999	394	7,393	1,263	6,130	1,149	4,981	525	5,506	835	6,341			

Peak Period (two-hour)

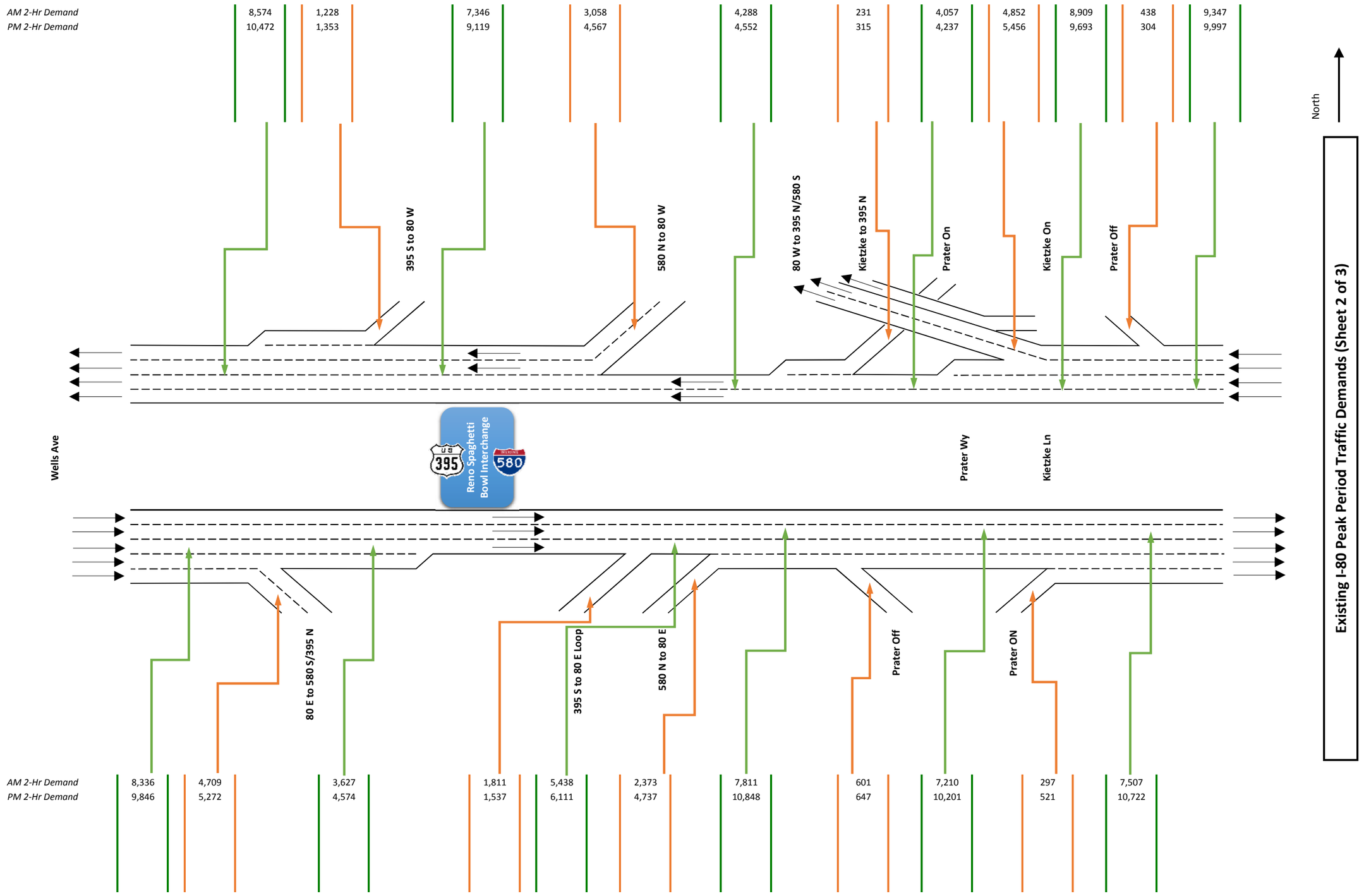
Existing I-80 Peak Period Traffic Demands (Sheet 1 of 3)

North

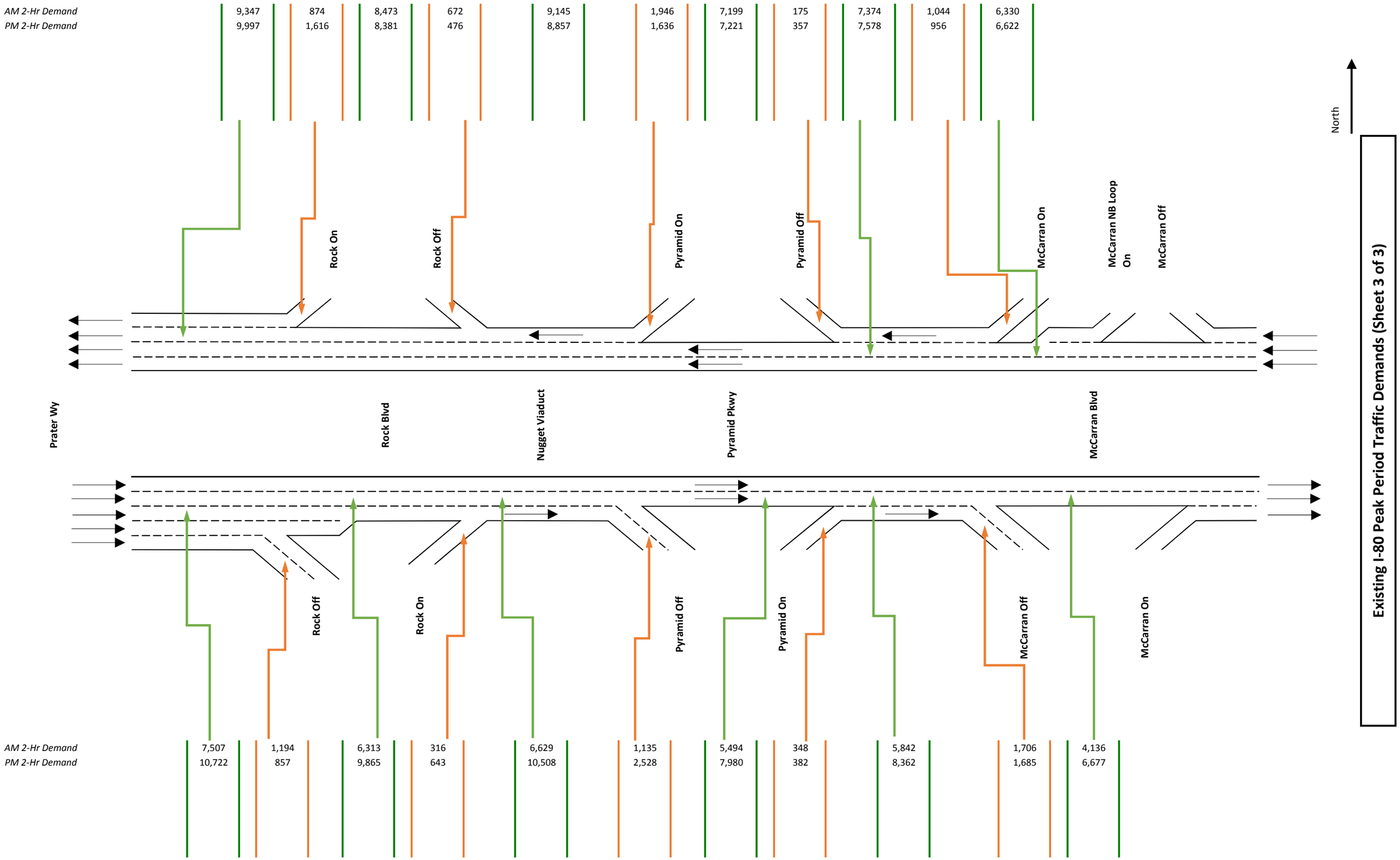
	Keystone On	Keystone Off	Sierra On	Sierra Off	Center On	Center Off	Wells On	Wells Off
AM 2-Hr Demand	3,695	413	3,282	1,599	4,881	363	4,518	2,808	7,326	646	6,680	1,894	8,574
PM 2-Hr Demand	7,841	768	7,073	2,615	9,688	1,173	8,515	2,169	10,684	1,355	9,329	1,143	10,472

Keystone Ave | Sierra | Virginia | Center | Wells Ave

	Keystone Off	Keystone On	Sierra Off	Center On	Wells Off	Wells On
AM 2-Hr Demand	6,613	503	6,110	2,597	8,707	1,069	7,638	1,194	8,832	1,328	7,504	832	8,336
PM 2-Hr Demand	5,206	602	4,604	2,230	6,834	724	6,110	2,786	8,896	742	8,154	1,692	9,846


AM 2-Hr Demand
PM 2-Hr Demand
8,574
10,472
1,228
1,353
7,346
9,119
3,058
4,567
4,288
4,552
231
315
4,057
4,237
4,852
5,456
8,909
9,693
438
304
9,347
9,997
North
395 S to 80 W
580 N to 80 W
80 W to 395 N/580 S
Kietzke to 395 N
Prater On
Kietzke On
Prater Off
Wells Ave
Reno Spaghetti Bowl Interchange
Prater Wy
Kietzke Ln
80 E to 580 S/395 N
395 S to 80 E Loop
580 N to 80 E
Prater Off
Prater ON
AM 2-Hr Demand
PM 2-Hr Demand
8,336
9,846
4,709
5,272
3,627
4,574
1,811
1,537
5,438
6,111
2,373
4,737
7,811
10,848
601
647
7,210
10,201
297
521
7,507
10,722
Existing I-80 Peak Period Traffic Demands (Sheet 2 of 3)

Existing I-80 Peak Period Traffic Demands (Sheet 3 of 3)



Existing I-580/US 395 Peak Period Traffic Demands (Sheet 1 of 3)

North

	Meadowood Mall Wy	Virginia St	Moana Ln	Plumb Ln	Villanova Dr
AM 2-Hr Demand	10,094	852	10,946	584	10,362
PM 2-Hr Demand	8,435	1,073	9,508	892	8,616

Meadowood Of

Kietzke Off

Virginia Off

Moana On

Moana Off

Plumb On

Airport Off

Villanova Off

	Meadowood Mall Wy	Virginia St	Moana Ln	Plumb Ln	Villanova Dr
AM 2-Hr Demand	2,386	12,748	1,158	11,590	362	11,952	1,419	13,371
PM 2-Hr Demand	2,690	11,306	1,792	9,514	159	9,673	1,628	11,301

Meadowood On

Virginia On

Moana Off

Moana On

Plumb Off

Airport On

Villanova On

	Meadowood Mall Wy	Virginia St	Moana Ln	Plumb Ln	Villanova Dr
AM 2-Hr Demand	8,033	910	8,943	787	8,156	1,573	9,729	1,531	8,198	86	8,284	993	9,277
PM 2-Hr Demand	10,342	1,839	12,181	886	11,295	3,021	14,316	1,365	12,951	212	13,163	2,347	15,510

Existing I-580/US 395 Peak Period Traffic Demands (Sheet 2 of 3)

North

AM 2-Hr Demand	13,371	883	12,488	1,888	14,376	503	13,873	880	14,753	3,829	10,924	3,697	7,227
PM 2-Hr Demand	11,301	1,766	9,535	1,349	10,884	1,108	9,776	773	10,549	3,646	6,903	2,896	4,007

Mill On | Mill Off | Glendale On | Glendale Off | 80 E to 580 S | 80 W to 580 S

to Villanova Dr | Mill St | Glendale Ave

Reno Spaghetti Bowl Interchange

Mill Off | Mill Loop On | Glendale Off | Glendale Loop On | 580 N to 80 E | 580 N to 80 W

AM 2-Hr Demand	9,277	1,803	7,474	711	8,185	757	7,428	394	7,822	2,373	5,449	3,058	2,391
PM 2-Hr Demand	15,510	951	14,559	1,798	16,357	491	15,866	984	16,850	4,737	12,113	4,567	7,546

Existing I-580/US 395 Peak Period Traffic Demands (Sheet 3 of 3)

North

AM 2-Hr Demand	7,227	3,039	10,266	954	9,312	392	9,704	2,250	7,454	1,824	5,630	815	6,445
PM 2-Hr Demand	4,007	2,890	6,897	836	6,061	435	6,496	1,592	4,904	1,082	3,822	965	4,787

395 S to 80 W/ 80 E | Oddie On | Oddie Off | McCarran On | Clear Acre On | Clear Acre Off

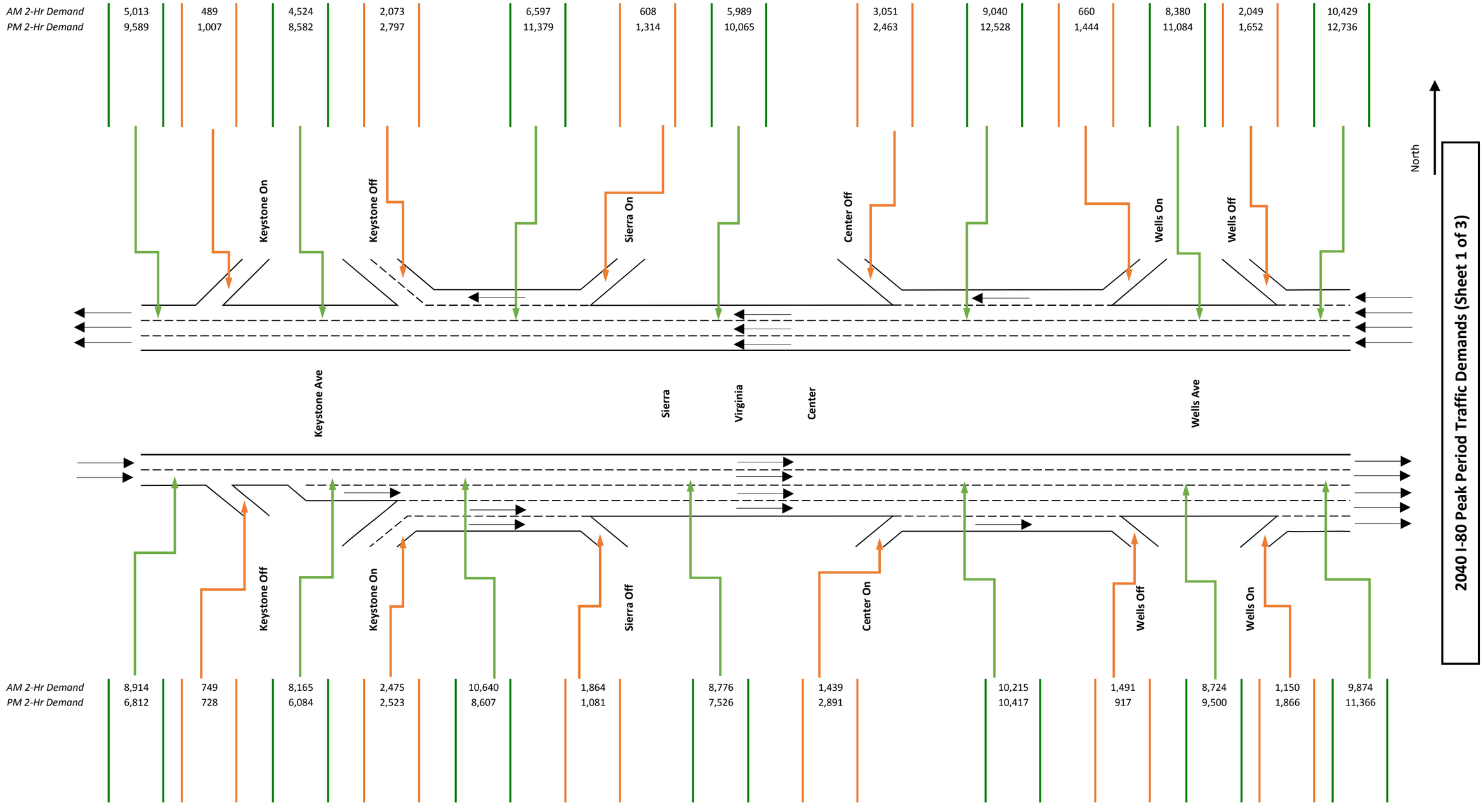
Oddie Blvd | McCarran Blvd | Clear Acre Ln

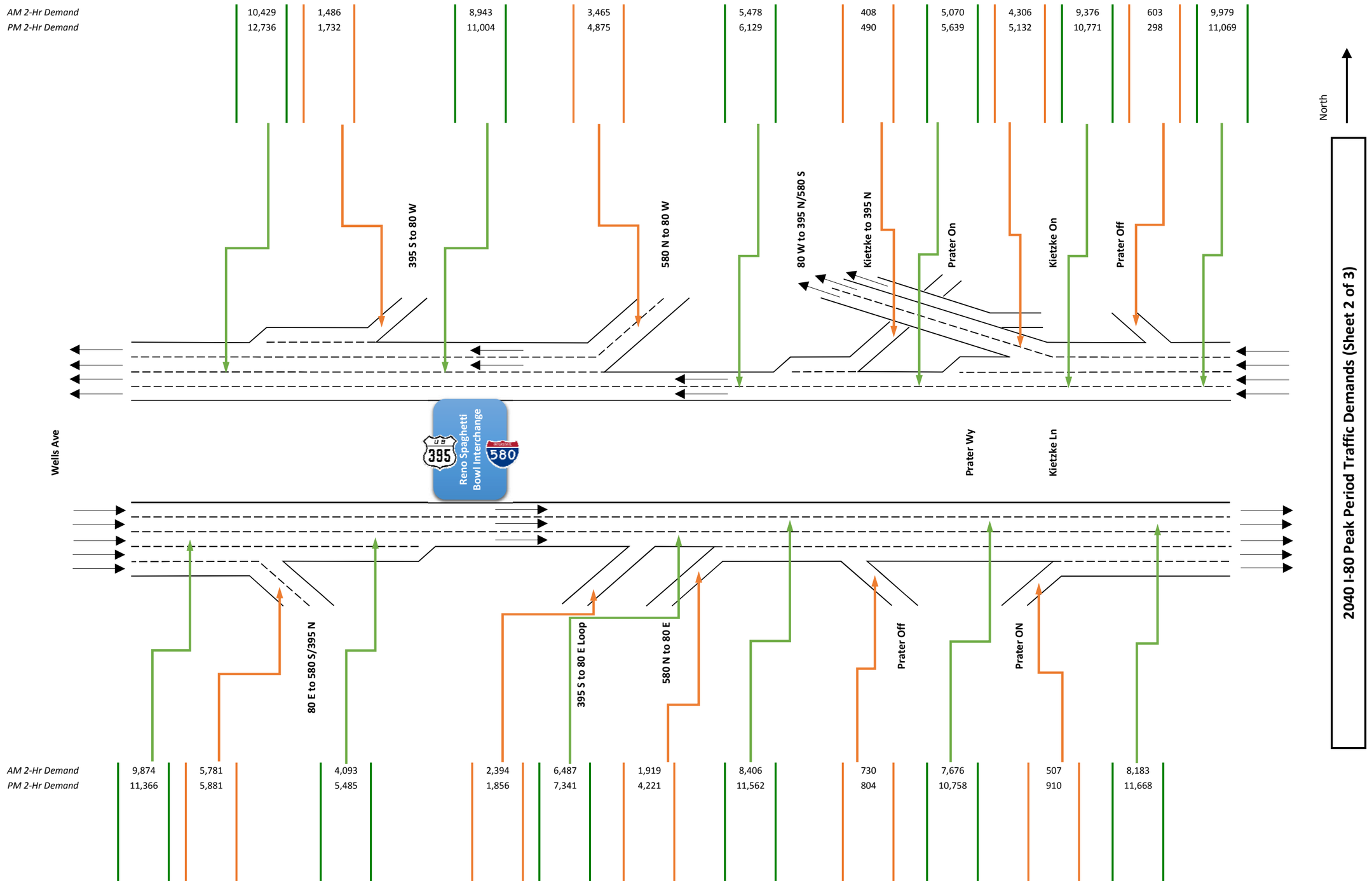
Reno Spaghetti Bowl Interchange

80 E to 395 N | 80 W to 395 N | Oddie Off | Oddie On | McCarran Off | Clear Acre Off | McCarran On | Clear Acre On

AM 2-Hr Demand	2,391	880	3,271	1,155	4,426	543	3,883	311	4,194	1,080	3,114	543	2,571	436	3,007	143	3,150
PM 2-Hr Demand	7,546	1,626	9,172	2,560	11,732	1,259	10,473	690	11,163	2,310	8,853	2,085	6,768	1,016	7,784	330	8,114

2040 I-80 Peak Period Traffic Demands (Sheet 1 of 3)





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RSB_DemandFigures_withadjustments_v4.xlsx

5/22/2017

2040 I-80 Peak Period Traffic Demands (Sheet 3 of 3)

North

	Prater Wy	Rock On	Rock Blvd	Rock Off	Nugget Viaduct	Pyramid On	Pyramid Pkwy	Pyramid Off	McCarran On	McCarran Blvd	McCarran NB Loop On	McCarran Off
AM 2-Hr Demand	9,979	1,042	8,937	1,017	9,954	1,873	8,081	296	8,377	1,071	7,306	
PM 2-Hr Demand	11,069	1,857	9,212	767	9,979	1,529	8,450	511	8,961	1,128	7,833	

	Rock Off	Rock On	Pyramid Off	Pyramid On	McCarran Off	McCarran On
AM 2-Hr Demand	8,183	1,131	7,052	309	7,361	1,047	6,314	703	7,017	2,131	4,886
PM 2-Hr Demand	11,668	965	10,703	713	11,416	1,771	9,645	248	9,893	1,998	7,895

2040 I-580/US 395 Peak Period Traffic Demands (Sheet 1 of 3)

North

	Meadowood Off	Kietzke Off	Virginia Off	Moana On	Moana Off	Plumb On	Airport Off	Villanova Off
AM 2-Hr Demand	10,956	1,015	11,971	681	11,290	2,839	14,129	1,255	12,874	387	13,261	1,551	14,812
PM 2-Hr Demand	9,136	1,126	10,262	1,012	9,250	3,192	12,442	1,799	10,643	173	10,816	1,865	12,681

Meadowood Mall Wy | Virginia St | Moana Ln | Plumb Ln | Villanova Dr

	Meadowood On	Virginia On	Moana Off	Moana On	Plumb Off	Airport On	Villanova On
AM 2-Hr Demand	8,148	963	9,111	810	8,301	2,193	10,494	1,623	8,871	86	8,957	1,308	10,265
PM 2-Hr Demand	10,706	1,858	12,564	1,057	11,507	3,562	15,069	1,490	13,579	342	13,921	2,637	16,558

2040 I-580/US 395 Peak Period Traffic Demands (Sheet 2 of 3)

North

AM 2-Hr Demand	14,812	1,338	13,474	2,402	15,876	601	15,275	1,520	16,795	4,327	12,468	2,770	9,698
PM 2-Hr Demand	12,681	2,110	10,571	1,691	12,262	1,189	11,073	1,457	12,530	4,120	8,410	2,159	6,251

Mill On | Mill Off | Glendale On | Glendale Off | 80 E to 580 S | 80 W to 580 S

to Villanova Dr

Mill St

Glendale Ave

Reno Spaghetti Bowl Interchange

Mill Off | Mill Loop On | Glendale Off | Glendale Loop On | 580 N to 80 E | 580 N to 80 W

AM 2-Hr Demand	10,265	1,728	8,537	932	9,469	864	8,605	643	9,248	1,919	7,329	3,465	3,864
PM 2-Hr Demand	16,558	627	15,931	2,302	18,233	532	17,701	1,474	19,175	4,221	14,954	4,875	10,079

2040 I-580/US 395 Peak Period Traffic Demands (Sheet 3 of 3)

North

AM 2-Hr Demand	9,698	3,880	13,578	816	12,762	1,200	13,962	1,979	11,983	2,400	9,583	246	9,829	2,389	12,218
PM 2-Hr Demand	6,251	3,588	9,839	590	9,249	807	10,056	1,451	8,605	1,425	7,180	350	7,530	1,888	9,418

395 S to 80 W/ 80 E | Oddie On | Oddie Off | McCarran On | Clear Acre On | Clear Acre Off | Sutro Off

Reno Spaghetti Bowl Interchange

Oddie Blvd | McCarran Blvd | Clear Acre Ln | Sutro St

80 E to 395 N | 80 W to 395 N | Oddie Off | Oddie On | McCarran Off | Clear Acre Off | McCarran On | Clear Acre On/ Sutro On

AM 2-Hr Demand	3,864	1,454	5,318	1,536	6,854	557	6,297	537	6,834	968	5,866	485	5,381	368	5,749	785	6,534
PM 2-Hr Demand	10,079	1,761	11,840	2,973	14,813	1,372	13,441	844	14,285	2,477	11,808	2,249	9,559	1,391	10,950	1,845	12,795

From:	Wright, Christopher D
To:	Roldan, Jim/SCO
Cc:	Wooster, Mark J; Tortelli, Judy L; Hong, Hoang
Subject:	FW: RSB-NEPA Forecasting [EXTERNAL]
Date:	Wednesday, July 05, 2017 5:46:41 PM
Attachments:	image001.png

Hi Jim,

Below is a response from Xuan Wang at RTC Washoe regarding the RSB Traffic Forecasts.

Thanks,
-Chris

Chris Wright
Supervisor 3, Associate Engineer

Nevada Department of Transportation
Planning, Traffic Information Systems Division - C813
1263 South Stewart Street
Carson City, Nevada 89712
Phone: (775) 888-7443
cwright@dot.state.nv.us

From: Xuan Wang [mailto:XWang@rtcwashoe.com]
Sent: Wednesday, July 05, 2017 3:39 PM
To: Wright, Christopher D <CWright@dot.nv.gov>
Cc: Daniel Doenges <DDoenges@rtcwashoe.com>
Subject: RE: RSB-NEPA Forecasting

Chris,

My only comment is that the 2040 RTP was adopted on May,18th, 2017. In the report, it says the RTP is pending. Other than that, I don't have major comments with the adjustments. Thank you!

Xuan

From: Wooster, Mark J
Sent: Friday, June 09, 2017 3:17 PM
To: 'Xuan Wang' <XWang@rtcwashoe.com>; 'Amy Cummings' <acummings@rtcwashoe.com>
Cc: Tortelli, Judy L <JTortelli@dot.nv.gov>; Hong, Hoang <HHong@dot.nv.gov>;

'Jim.Roldan@CH2M.com' <Jim.Roldan@CH2M.com>; Wright, Christopher D <CWright@dot.nv.gov>
Subject: FW: RSB-NEPA Forecasting

Good Afternoon Amy and Xuan,
In the spirit of partnership between RTC Washoe and NDOT, I wanted to send the attached traffic forecasts your way and provide you with an opportunity for input into the Reno Spaghetti Bowl project NEPA process. If you have any questions or comments on the attached Forecasting Memo, please let me know. Thank you.

Regards,

Mark Wooster
Traffic Information Systems Assistant Chief
Nevada Dept of Transportation
1263 S. Stewart Street
Carson City, NV 89712
Desk: 775-888-7156
Cell: 775-315-1612
mwooster@dot.nv.gov

From: Tortelli, Judy L
Sent: Friday, June 09, 2017 2:52 PM
To: Wooster, Mark J <MWooster@dot.nv.gov>
Cc: Wright, Christopher D <CWright@dot.nv.gov>; Hong, Hoang <HHong@dot.nv.gov>; Roldan, Jim/SCO <Jim.Roldan@CH2M.com>; Johnson, Nicholas J <NJohnson@dot.nv.gov>
Subject: RSB-NEPA Forecasting

Hi Mark,
Per our conversation and since Chris is out on vacation I have attached the approved Forecasting memo for the Reno Spaghetti Bowl NEPA Project. Can you forward this to RTC as a courtesy so they can let us know if they have any concerns? It's probably best to send it to both Xuan and Amy.

I think it would be beneficial to provide them an opportunity to review so we don't get blind-sighted down the road with issues regarding our forecasting adjustments. It will also provide documentation of concurrence for NEPA purposes so we don't have to jump through a bunch of hoops last minute like we did on Garnet Design-Build. Please cc: Jim (CH2M his email is included), Hoang, and I. Let me know if you need anything else and have a GREAT weekend!
Thanks,
Judy

Judy L. Tortelli, P.E.
Senior Operations Analyst
Nevada Department of Transportation
1301 Old Hotsprings Road, Room 108
Carson City, NV 89712

PH: (775) 888-7811
Cell: (775) 843-1212

Attachment 5 Truckee Meadows Affordable Housing Forum: Action Items for Top-Priority Challenges

Action Items for Top Priority Challenges

	Limited Financial Resources	Lack of Coordination	Overall Lack of Affordable Housing	Few Incentives or Requirements for Market Rate Developers	"De Facto" Affordable Housing (Weekly Motels)
Actions/ Strategies	• Divert all or some of the Room Tax to support affordable housing • Identify low-hanging fruit to spur engagement • Develop continuum of public engagement • Raise money for technical assistance • Identify additional incentives • Limit initial set of priorities/focus areas • Demonstrate economic impact of affordable housing • Access state revenue (e.g., registration fees)	• Update housing element in local master plans (Washoe County Planning Department) • Follow through on Enterprise forum with commitment of resources, financial backing, and facilitation • Identify/create a lead entity with broad-based community support (perhaps a regional planning coalition?) • Create coalition between TMRPA and Truckee Meadows Healthy Communities to drive this work moving forward/	• Adopt a form-based code • Create/encourage more mixed-use/mixed-income development • Create/encourage more transit-oriented development • Pursue public-private joint development • Target regional employment centers • Create/encourage more supportive housing (integrated services, such as day care) • Offer discounts on land • Create a community land trust (use this to	• Develop understanding of current law, opportunities to change the law, and the resources currently not used or underutilized • Review local and state regulations (including impact, barriers, opportunities, and appropriate application) • Gather and review best practices from other communities • Create policies to implement • Consider creating a "cabinet" (Oakland example) • Inclusive process for developing	• Expand motels to homes program • Expand voucher program • Provide alternative housing/boost overall supply of housing • Stop inflow • Develop bridges out • Explore set-asides • Explore increasing cross roads to homes • Analysis and needs assessment of population

	Limited Financial Resources	Lack of Coordination	Overall Lack of Affordable Housing	Few Incentives or Requirements for Market Rate Developers	"De Facto" Affordable Housing (Weekly Motels)
	• Identify leaders and grow new leaders • Restructure renewal funding inflation factors to support affordable housing • Collaborate with businesses to offer workforce housing • Pool/blend existing resources to stretch current dollars • Identify and pursue innovative financing vehicles • Secure gap financing on a project-by-project basis	provide backbone support • Map gaps in affordable housing supply	acquire federal land and improve) • Preserve and revitalize existing housing	recommendations for incentives • Public education/ outreach • Establish Home Rule • Recalibrate sewer fees by unit size • Affordable housing impact fees for market rate housing +/- $3 per square foot • Defer payments for impact fees • Assure expedited permitting • Encourage smaller home products • Inclusionary zoning • Offer assistance with paperwork	
Source: Enterprise Community Partners, Inc. (2017)					

Attachment 6 Truckee Meadows Regional Planning Agency: Table of Planned Unit Developments and Tentative Maps

Planned Unit Developments (as of July 6, 2018)

Label	Development Name	Jurisdiction	Allowed Units	Built Units	Unbuilt Units
1	Stanford Industrial Park	Sparks	0	0	0
2	Sparks Business Park	Sparks	0	0	0
3	Tierra del Sol	Sparks	107	107	0
4	Marina Village	Sparks	299	299	0
5	Wildcreek Business Park	Sparks	0	0	0
6	The Vistas	Sparks	1614	1222	392
7	Pioneer Meadows	Sparks	2756	1136	1620
8	Wingfield Springs	Sparks	2564	2092	472
9	Spanish Springs Town Center	Sparks	0	0	0
10	Sparks Crossing	Sparks	0	0	0
11	Kiley Ranch North	Sparks	4463	519	3944
12	Desert Highlands	Sparks	1028	1028	0
13	D'Andrea	Sparks	2230	1819	411
14	Kiley Ranch South	Sparks	2270	2113	157
15	Sparks Galleria	Sparks	170	170	0
16	Copper Canyon	Sparks	2109	0	2109
17	Crestgate Pyramid	Sparks	0	0	0
18	Stonebrook	Sparks	2135	0	2135
19	Sonoma Highlands	Sparks	2510	0	2510

Label	Development Name	Jurisdiction	Allowed Units	Built Units	Unbuilt Units
20	Somersett	Reno	2421	2313	108
21	Caughlin Ranch	Reno	1990	1885	105
22	South Meadows III	Reno	2070	493	1577
23	Hilton Properties	Reno	0	0	0
24	Evans Ranch	Reno	5679	0	5679
25	Sharlands	Reno	992	992	0
26	Sky Vista	Reno	2286	2286	0
27	First Independent Bank Center	Reno	0	0	0
28	Golden Valley Industrial Park	Reno	0	0	0
29	Mayberry Landing	Reno	0	0	0
30	McQueen Crossing	Reno	0	0	0
31	Monte Vista	Reno	0	0	0
32	Mortensen-Garson	Reno	3000	4	2996
33	Mountain View-Castle Creek	Reno	0	0	0
34	Plumgate	Reno	5	0	5
35	Rancharrah	Reno	691	0	691
36	Keystone Canyon	Reno	745	289	456
37	Marina Landing	Sparks	0	0	0
38	South Meadows I & II	Reno	0	0	0
39	The Legends at Sparks Marina	Sparks	0	0	0

Label	Development Name	Jurisdiction	Allowed Units	Built Units	Unbuilt Units
40	Verdi Business Park	Reno	0	0	0
41	Dorostkar	Reno	250	250	0
42	Club Lakeridge	Reno	320	320	0
43	Little City Landscaping	Reno	15	0	15
44	MDC/Plumb Tree Plaza	Reno	9	9	0
45	IDI Stead Business Center	Reno	0	0	0
46	Sierra Senior Care	Reno	56	44	12
47	Hillside Cemetery	Reno	0	0	0
48	Pioneer Parkway	Reno	756	110	646
49	Vista Hills	Reno	338	0	338
50	Bella Vista Ranch Phase II	Reno	575	0	575
51	Sierra Crest Senior Apartments	Sparks	72	72	0
52	Miramonte	Sparks	1434	546	888
53	Canyon Hills	Sparks	203	198	5
54	Galleria Station	Sparks	189	179	10
55	Sierra View Townhomes	Sparks	45	0	45
56	Skyridge	Sparks	115	63	52
57	Eagle Peak	Sparks	40	0	40
58	Upper Highlands at Cimarron East	Sparks	251	251	0
59	Cimarron	Sparks	811	811	0

Label	Development Name	Jurisdiction	Allowed Units	Built Units	Unbuilt Units
60	The Foothills at Wingfield Springs	Sparks	2260	1976	284
61	Wyndam Hills/The Highlands	Sparks	229	229	0
62	The Pines	Reno	251	0	251
63	SBE	Reno	162	36	126
64	Double Diamond	Reno	3300	3104	196
65	Curti Ranch	Reno	574	571	3
66	Edgewater	Reno	242	223	19
67	Bella Vista Ranch	Reno	1700	849	851
68	Juniper Ridge	Reno	143	131	12
69	University Ridge	Reno	488	464	24
70	Belsera	Reno	50	50	0
71	Rosewood Lakes	Reno	835	522	313
72	The Cottages	Reno	109	109	0
73	Villagio Della Montagne	Reno	60	58	2
74	Ventana Pointe/The Vineyards	Reno	70	0	70
75	Butler Ranch	Reno	1550	0	1550
76	Caramella Ranch Estates	Reno	1316	6	1310
77	Wildcreek Golf Villas	Sparks	136	136	0
78	El Rancho Estates	Sparks	72	1	71
79	Peigh	Washoe County	252	146	106

Label	Development Name	Jurisdiction	Allowed Units	Built Units	Unbuilt Units
80	Alexander Lake	Reno	13	0	13
81	Quail Valley in the Pines	Reno	28	7	21
82	Brighton Manor	Reno	129	92	37
83	The Traditions at Court Street	Reno	19	19	0
84	Vintage Hills Senior Apartments	Reno	202	201	1
85	Manzanita Pass	Reno	325	324	1
86	Silver Star Ranch	Reno	1600	0	1600
87	Echeverria Silver Lake	Reno	0	0	0
88	Damonte Ranch	Reno	4905	3846	1059
89	Wildcreek Commercial	Sparks	142	106	36
90	West Meadows	Reno	336	0	336
91	Sierra Canyon II	Reno	375	360	15
92	Wild Stallion Estates	Reno	580	271	309
93	Falcon Ridge	Washoe County	269	0	269
94	Golden Triangle	Sparks	625	0	625
95	Wedge	Reno	59	51	8
96	Duxbury	Reno	42	42	0
97	Stonegate	Reno	5000	0	5000

Source: TMRPA 2018

Tentative Map Developments (as of July 6, 2018)

Label	Development Name	Jurisdiction	Approved Units	Built Units	Unbuilt Units
1	Silver Dollar Estates	Reno	619	0	619
2	Esplanade at Northgate	Reno	48	0	48
3	Bria Court	Sparks	7	0	7
4	The Greens at Town Center	Reno	10	0	10
5	Rancharrah Equestrian Village	Reno	9	0	9
6	Acenté	Washoe County	225	0	225
7	Miramonte Townhomes	Sparks	448	0	448
8	Carmella Ranch Estates	Reno	935	6	929
9	Golden Mesa North	Washoe County	115	0	115
10	Damonte Ranch Village 9B	Reno	50	0	50
11	Sierra Shadows	Sparks	17	0	17
12	Bailey Creek Estates	Washoe County	56	0	56
13	Tiny 10	Reno	10	0	10
14	Stead 40 (Phase 2)	Reno	68	0	68
15	Stead 40	Reno	179	0	179
16	Somersett Village 6	Reno	165	0	165
17	Silent Sparrow	Washoe County	24	3	21
18	Pyramid Ranch Annex	Washoe County	61	0	61
19	Blackstone Estates	Washoe County	161	0	161

Label	Development Name	Jurisdiction	Approved Units	Built Units	Unbuilt Units
20	Sugarloaf Ranch Estates	Washoe County	119	0	119
21	Kiley Ranch North Phase 6 (Villages 37A, 37B and 43)	Sparks	394	0	394
22	Pioneer Meadows Village 10	Sparks	140	0	140
23	North Valley Estates I	Reno	45	0	45
24	The Ridges at Hunter Creek	Washoe County	53	0	53
25	235 Ralston	Reno	28	0	28
26	Colina Rosa	Washoe County	94	0	94
27	West Meadows Estates Phase II	Reno	55	0	55
28	Rancharrah Village 5	Reno	20	0	20
29	West Meadows Estates	Reno	269	0	269
30	North Valleys Estates III	Reno	66	0	66
31	Mill Street Lofts	Reno	50	0	50
32	Bonde Farms	Reno	11	0	11
33	North Valley Estates II	Reno	141	0	141
34	Regency Park II	Reno	204	0	204
35	Rancharrah Villages 1, 2, & 3	Reno	114	0	114
36	Ridge Hollow	Reno	44	0	44
37	Pine Bluff	Reno	43	21	22
38	Alamo Square Townhomes	Reno	38	3	35
39	Meridian 120 North	Reno	273	0	273

Label	Development Name	Jurisdiction	Approved Units	Built Units	Unbuilt Units
40	Arroyo Crossing	Reno	237	2	235
41	Damonte Ranch Village 9	Reno	111	43	68
42	The Overlook at Keystone Canyon	Reno	272	0	272
43	Dorokstar/Wedge Parkway	Reno	252	252	0
44	Kiley Ranch North Village 37C	Sparks	147	0	147
45	Falcon Ridge	Washoe County	142	0	142
46	Gulling Heights	Reno	6	6	0
47	Bella Vista Ranch Villages C & D	Reno	553	26	527
48	Bella Vista Ranch Village B-2	Reno	121	121	0
49	Damonte Ranch Village 7	Reno	58	58	0
50	Tonopah Lofts at Midtown	Reno	8	0	8
51	Northridge	Reno	91	0	91
52	Ladera Ranch	Washoe County	356	0	356
53	Palisades	Reno	260	65	195
54	Edgewater at Virginia Lake	Reno	338	338	0
55	Sun Mesa (Landmark Homes)	Washoe County	207	104	103
56	Fountainhouse at Victorian Square	Sparks	220	220	0
57	Pinnacles Unit 3	Sparks	42	42	0
58	Pioneer Meadows Villages 7B & 7C	Sparks	236	234	2
59	Upper Highlands at Cimarron East Phase 4	Sparks	41	41	0

Label	Development Name	Jurisdiction	Approved Units	Built Units	Unbuilt Units
60	Stonebrook	Sparks	617	0	617
61	Kiley Ranch North Village 38	Sparks	110	29	81
62	Galleria Station II	Sparks	74	64	10
63	Pebble Creek Estates	Washoe County	83	0	83
64	Mountain View Estates 1B	Reno	170	87	83
65	Mountaingate 78	Reno	78	0	78
66	Silver Hills	Washoe County	680	0	680
67	Harris Ranch	Washoe County	610	0	610
68	Autumn Wood	Washoe County	47	0	47
69	St James Village	Washoe County	530	137	393
70	Donovan Ranch/Shadow Ridge-Syncon	Washoe County	390	207	183
71	Sierra Reflections	Washoe County	938	0	938
72	Montreux 2000	Washoe County	357	144	213
73	Broken Hill	Washoe County	170	0	170
74	Woodland Village	Washoe County	2028	1598	430
75	Damonte Ranch19A & 19B	Reno	391	365	26
76	Wild Stallion Estates	Reno	580	271	309
77	Terrasante	Washoe County	210	0	210
78	Damonte Ranch 4, 5, & 6	Reno	564	350	214
79	Stonefield Phase 4	Reno	470	0	470

Label	Development Name	Jurisdiction	Approved Units	Built Units	Unbuilt Units
80	Esplanade at Damonte Ranch Village 24	Reno	414	222	192
81	Damonte Ranch Ph V, Villages 1&2, Units 2, 3, & 4	Reno	368	146	222
82	Somersett Village 5D	Reno	100	79	21
83	Golden Hills	Reno	317	312	5
84	Damonte Ranch Village 3C&3D	Reno	89	82	7
85	Damonte Ranch Village 11C	Reno	8	4	4
86	Damonte Ranch Village 10 & 11	Reno	406	276	130
87	Silver Vista	Reno	51	0	51
88	Stonebrook Phase 2	Sparks	459	0	459
89	Kiley Ranch North Phase 7	Sparks	344	0	344
90	Mountain View Estates - Unit 3	Reno	75	0	75
91	Lemon Valley Heights	Washoe County	206	0	206
92	Golden Mesa South	Washoe County	32	0	32
93	Valle Vista	Washoe County	75	0	75
94	Pebble Creek	Washoe County	344	319	25
95	Eagle Canyon Ranch	Washoe County	465	415	50
96	Ventana Ridge	Reno	70	0	70

Source: TMRPA 2018