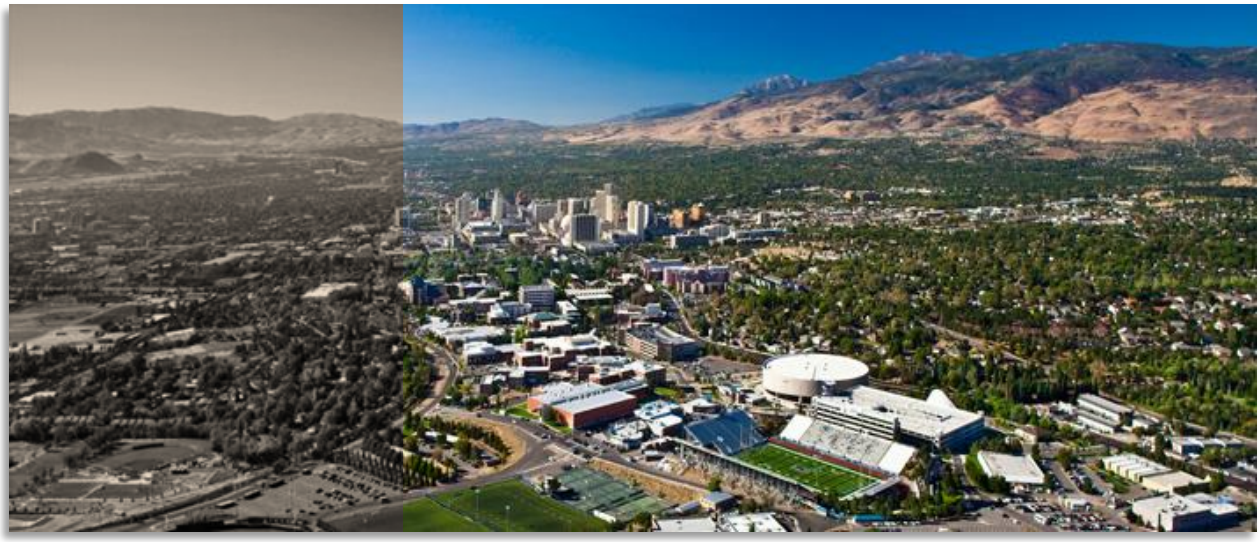
Washoe County Health District,
Air Quality Management Division

Ozone Advance Path Forward
Annual Progress Report



February 2, 2018

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Public Health
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WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

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Glossary

AQMD	Washoe County Health District, Air Quality Management Division
AQS	Air Quality System
CFR	Code of Federal Regulations
CNG	Compressed Natural Gas
COPD	Chronic Obstructive Pulmonary Disease
EPA	U.S. Environmental Protection Agency
GDF	Gasoline Dispensing Facility
GOE	Governor's Office of Energy
HA 87	Hydrographic Area 87
KPI	Key Performance Indicator
LEED	Leadership in Energy & Environmental Design
NAAQS	National Ambient Air Quality Standards
NO_x	Oxides of Nitrogen
O_3	Ozone
ppm	Parts per million
RTC	Regional Transportation Commission
SIP	State Implementation Plan
UHI	Urban Heat Island
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WCHD	Washoe County Health District
WCSD	Washoe County School District

In a region with a growing population,
if you're doing nothing, you're losing ground.

- Stewart Udall

EXECUTIVE SUMMARY

After the U.S. Environmental Protection Agency (EPA) promulgated the 2008 ozone National Ambient Air Quality Standard (NAAQS), the Washoe County Health District, Air Quality Management Division (AQMD) has been very proactive to encourage voluntary initiatives to improve air quality and avoid violating the ozone standard. Short-term initiatives targeted technology (i.e., smog check programs and clean school busses) and behavior (i.e., employee trip reduction and Safe Routes to School). Long-term initiatives have focused on improving the "business as usual" land use development patterns and built environment. These initiatives are intended to increase transportation choices and reduce the impacts from on-road motor vehicles.

Shortly after EPA promulgated the 2015 ozone NAAQS, the Washoe County Health District (WCHD) requested to participate in the Ozone Advance program. The Advance program provides resources to help implement additional initiatives to reduce ozone concentrations. EPA formally accepted the WCHD's request in February 2016. This Path Forward annual report provides a summary of ozone concentrations and recent initiatives to improve air quality.

As of January 1, 2018, ozone concentrations in Washoe County:[1,2]

- Attain the Ozone NAAQS based on 2014-2016 certified air monitoring data, and
- Attain the Ozone NAAQS based on 2015-2017 preliminary air monitoring data.

Many factors impact air quality such as vehicle miles traveled, miles of bikeways, and tree canopies and these key performance indicators (KPI) are included. Because solutions to improve air quality will benefit the environment, public health, and the economy, this report includes secondary (i.e., chronic disease rates) and associated (gross domestic product) KPI's. This is the first annual report and complements the 2017 Path Forward Plan.[3] Future reports may refine the KPI's as additional data becomes available, or as they are reevaluated for their connection to the Path Forward's five goals.

Although this report looks backward at what occurred to improve ozone concentrations, its most powerful benefit is to provide leadership the data and information needed to make good decisions that improve long-term air quality. Success will rely on the collective impact from all stakeholders working towards a common goal - a Healthy Community!

[1] Designations are based on the three most recent calendar years of certified air monitoring data. Air monitoring data are typically certified by May of each year. Designations for Nevada are formally codified in the Code of Federal Regulations at 40 CFR 81.329.
[2] Design values for the Reno3 monitor (AQS ID 32-031-0016) are calculated with EPA's concurrence of wildfire ozone exceptional events demonstrations for 2015 (August 18, 19, 21) and 2016 (July 2, 3, 4).
[3] www.epa.gov/advance/program-participants-washoe-county-nv.

1.0 OZONE ADVANCE PROGRAM

1.1 Purpose

EPA's Ozone Advance program began in April 2012 and focuses on maintaining the ozone NAAQS. The Advance program is flexible in the sense that participants determine their own goals, strategies, and priorities they want to implement. Although there are no guarantees that participation will prevent a non-attainment designation from ever occurring, the actions taken as part of Advance could better position an area to handle non-attainment requirements if they ever do apply.

Ozone Advance is a good fit for Washoe County. It encourages local voluntary initiatives to reduce air pollution before pursuing reductions becomes a mandatory requirement. These proactive efforts will position the area to continue to improve air quality and maintain the NAAQS. If Washoe County should violate the NAAQS, then the voluntary initiatives in the Path Forward Plan can feed into a future State Implementation Plan (SIP).

1.2 Path Forward Plan

In February 2016, the AQMD was formally accepted by EPA to participate in the Ozone Advance program. A Path Forward Plan was submitted to EPA in February 2017. The Plan includes near and long-term goals.

Near-term air quality goals emphasize improvements to behavior and technology. These initiatives will reduce VMT through: 1) Behavior change via trip reduction programs, and 2) technology to minimize on-road and non-road motor vehicle tailpipe emissions.

Long-term improvements will be achieved by shaping land use patterns to increase transportation choices and reduce the community's dependence on the automobile. This will be challenging because of the long history of "business as usual" development. Local governing boards (including the City of Reno, City of Sparks, Board of County Commissioners, Regional Planning Governing Board, and the Regional Transportation Commission of Washoe County) have adopted resolutions supporting land use decisions that reduce vehicle trips and Vehicle Miles Traveled (VMT).

The Path Forward Plan has five goals to improve Washoe County's ozone concentrations.

1. Reduce ozone precursor emissions from on-road motor vehicles
2. Reduce ozone precursor emissions from non-road motor vehicles and equipment
3. Reduce impacts from heat island effects that contribute to ozone formation.
4. Increase efficiency of buildings
5. Expand air quality education and outreach programs

1.3 Annual Reporting

The goal of Ozone Advance is to reduce ozone precursor emissions, improve air quality, and prevent violations of the ozone NAAQS. Key Performance Indicators (KPI) are used to benchmark progress towards achieving Ozone Advance goals. The ultimate KPI for success is the ozone design value. Design values are the statistics used to compare ambient air monitoring data against the NAAQS.

This is the first Path Forward annual report. Future reports may refine the KPI's as additional data becomes available, or as they are reevaluated for their connection to the Path Forward's five goals.

2.0 OZONE IN WASHOE COUNTY

2.1 Ambient Air Monitoring Network

The AQMD began monitoring ambient air quality in Washoe County in the 1960's, and the monitoring network has grown and evolved since that time. As of January 1, 2018, the AQMD operated and maintained seven ambient air monitoring sites. All seven of these sites monitor for ozone. See the most current Annual Network Plan (2017) and Network Assessment (2015) for detailed monitoring network information. The Plan and Assessment are available at the AQMD website (OurCleanAir.com). Table 2.1 summarizes the ambient air monitoring network.

Table 2.1
Ambient Air Monitoring Sites and Parameters Monitored

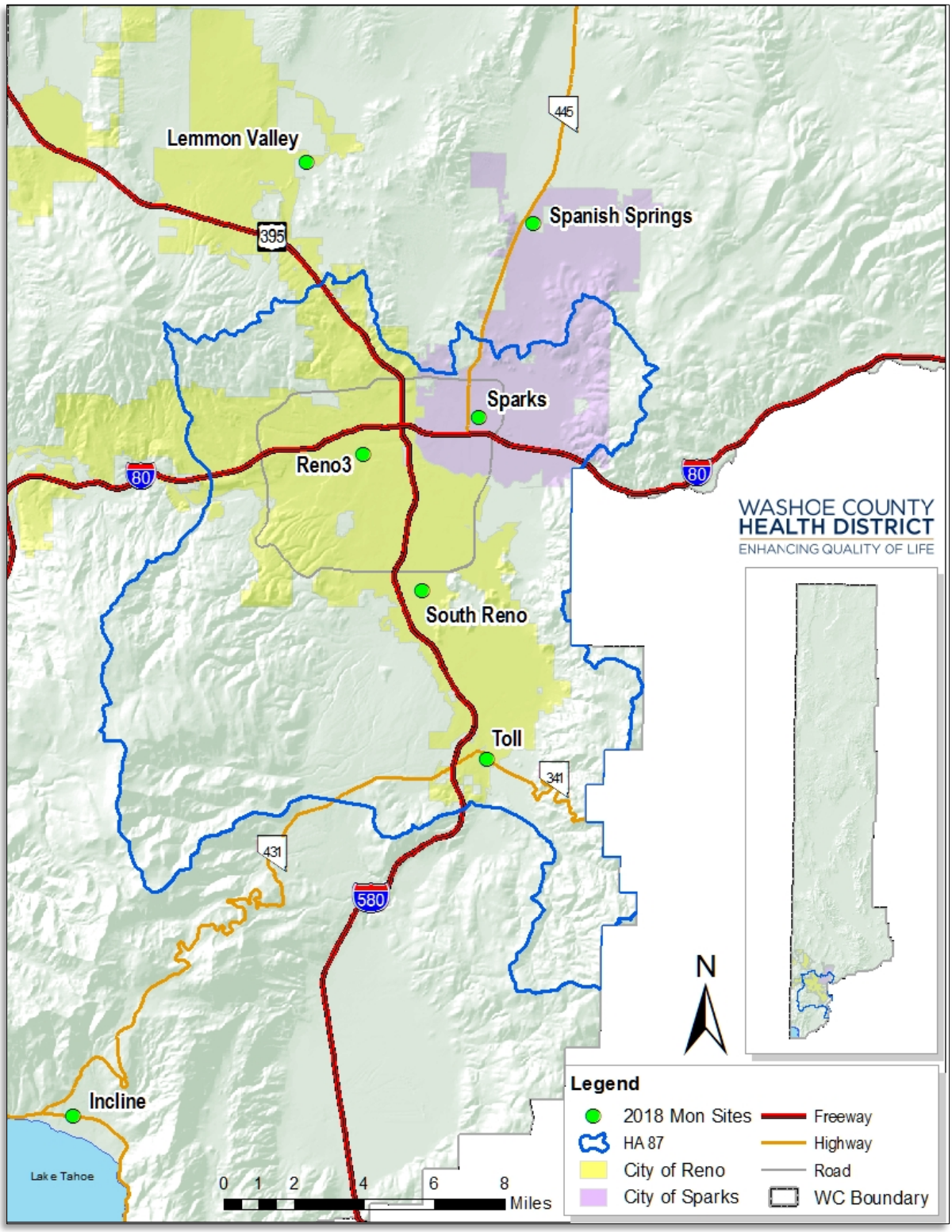
Site	Ozone	$PM_{2.5}$	PM_{10}	PM_{coarse}	$PM_{2.5}$ Speciation	NO_2	NO_x	Trace NO	Trace NOy	Trace SO_2	CO	Trace CO	Meteorology
Incline	✓												
Lemmon Valley	✓												
Reno3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
South Reno	✓												✓
Spanish Springs	✓	✓	✓	✓									
Sparks	✓	✓	✓	✓					✓	✓	✓		✓
Toll	✓		✓										✓

Figure 2.1 is the Reno3 ambient air monitoring station (AQS ID 32-031-0016) located in Downtown Reno.

Figure 2.2 illustrates the AQMD monitoring network. All sites currently monitor for ozone.

Figure 2.1
Reno3 Air Monitoring Station

Figure 2.2
Washoe County Health District - AQMD Ambient Air Monitoring Sites
(as of January 1, 2018)



2.2 Ozone Standard

EPA establishes and reviews health-based NAAQS for six criteria pollutants including ozone. The ozone NAAQS was first established in 1979, then strengthened in 1997 (0.08 ppm), 2008 (0.075 ppm), and 2015 (0.070 ppm). The 1979 ozone NAAQS was rescinded in conjunction with promulgating the more stringent 1997 standard.

2.3 Attainment Status

As of January 1, 2018, all areas of Washoe County are:

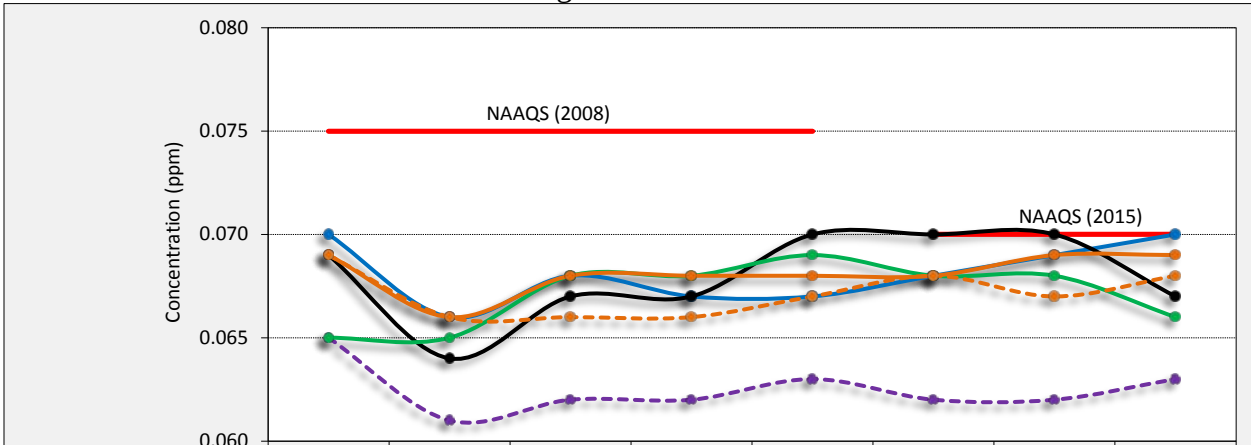
- Designated as "Attainment/Unclassifiable" for the 1997 Ozone NAAQS,
- Designated as "Attainment/Unclassifiable" for the 2008 Ozone NAAQS,
- Attaining the 2015 Ozone NAAQS based on 2013-2015, 2014-2016, and 2015-2017 (preliminary) ozone data.

EPA is recommending Washoe County to be designated in Spring 2018 as "Attainment/Unclassifiable" for the 2015 Ozone NAAQS based on 2013-2015 data (See Appendix A. Letter from EPA to Governor Sandoval dated December 20, 2017). Designations for Nevada are formally codified in the Code of Federal Regulations (CFR) at 40 CFR 81.329.

2.4 Design Value Trends

Design values are the statistic used to compare ambient air monitoring data against the NAAQS. It's used to determine if an area meets, or doesn't meet, the standard. For ozone, the design value is calculated by taking the average of the 4th high 8-hour concentration averaged over the most recent 3-years for each monitor. Ozone concentrations are strongly linked to population, employment, and on-road VMT. This connection can be seen by ozone levels associated with the Great Recession and recovery. Figure 2.3 illustrates ozone design values for each monitor since 2010.

Figure 2.3
Design Value Trend



	2010	2011	2012	2013	2014	2015	2016	2017
NAAQS	0.075	0.075	0.075	0.075	0.075	0.070	0.070	0.070
Incline	0.065	0.061	0.062	0.062	0.063	0.062	0.062	0.063
Lemmon Valley	0.070	0.066	0.068	0.067	0.067	0.068	0.069	0.070
Reno*	0.069	0.064	0.067	0.067	0.070	0.070	0.070	0.067
South Reno	0.065	0.065	0.068	0.068	0.069	0.068	0.068	0.066
Spanish Springs	-	-	-	-	-	-	-	-
Sparks	0.069	0.066	0.068	0.068	0.068	0.068	0.069	0.069
Toll	0.069	0.066	0.066	0.066	0.067	0.068	0.067	0.068

* Reno design values are calculated with EPA's concurrence of wildfire ozone exceptional events demonstrations for 2015 (August 18, 19, 21) and 2016 (July 2, 3, 4).

Table 2.2 includes the previous three years of 4th highs that were used to calculate 2017 design values.

Table 2.2
4th High 8-Hour Ozone Averages (2015-2017) and Design Values (ppm)

Year	Incline	Lemmon Valley	Reno3***	South Reno	Spanish Springs	Sparks	Toll
2015	0.062	0.072	0.070	0.070	-	0.070	0.069
2016	0.063	0.069	0.070	0.068	-	0.069	0.065
2017*	0.064	0.069	0.067	0.066	0.068	0.069	0.068
DV**	0.063	0.070	0.069	0.068	-	0.069	0.067

* Preliminary
** Annual 4th highest daily maximum 8-hr concentration, averaged over 3 years
*** Excludes data associated with EPA's concurrence of wildfire ozone exceptional events demonstrations for 2015 (August 18, 19, 21) and 2016 (July 2, 3, 4).

Ozone is a regional pollutant and since 2010, the design value site has fluctuated between Lemmon Valley, Reno3, South Reno, Sparks, and Toll (See Table 2.3).

Table 2.3
Design Value Site(s)

	2010	2011	2012	2013	2014	2015	2016	2017**
DV	0.070	0.066	0.068	0.068	0.070	0.070	0.070	0.070
Site(s)	LEM	LEM	RNO	SRN	RNO	RNO*	RNO*	LEM
		SPK	SRN	SPK				
		TOL	SPK					

* RNO design values for 2015 and 2016 are calculated with EPA's concurrence of wildfire ozone exceptional events demonstrations for 2015 (August 18, 19, 21) and 2016 (July 2, 3, 4).
** Preliminary

2.5 2017 Data

Table 2.4 lists the ten highest concentrations in 2017 for each monitor. It does not exclude any data that could potentially be considered exceptional events. Highlighted concentrations are those that occurred outside the typical ozone season (June-August).

Table 2.4
8-Hour Ozone Averages (ppm)
(2017*)

Rank	Incline		Lemmon Valley		Reno3		South Reno		Spanish Springs		Sparks		Toll	
	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date	Value	Date
1	0.069	07/19	0.071	05/24	0.071	07/20	0.068	07/19	0.071	07/20	0.071	07/19	0.074	07/19
2	0.067	07/20	0.070	06/06	0.070	07/19	0.067	07/20	0.070	05/24	0.071	07/20	0.074	07/20
3	0.065	07/01	0.069	07/20	0.069	09/01	0.067	08/03	0.068	06/06	0.069	07/21	0.071	07/01
4	0.064	06/06	0.069	09/01	0.067	07/01	0.066	07/01	0.068	07/19	0.069	08/03	0.068	07/21
5	0.063	06/07	0.067	06/07	0.067	08/01	0.064	09/01	0.067	06/07	0.068	07/01	0.067	08/03
6	0.062	05/24	0.067	06/30	0.067	08/03	0.063	06/06	0.067	06/30	0.067	05/24	0.066	05/24
7	0.062	12/02	0.066	07/19	0.066	05/24	0.062	05/24	0.066	07/03	0.067	09/01	0.065	06/06
8	0.060	07/21	0.065	07/21	0.066	06/06	0.062	07/21	0.065	07/21	0.066	06/30	0.065	06/07
9	0.060	09/03	0.064	06/02	0.066	06/30	0.062	08/01	0.065	06/02	0.066	07/03	0.065	07/03
10	0.059	05/26	0.064	07/01	0.066	07/21	0.061	06/30	0.065	06/20	0.065	06/06	0.064	09/01

* Preliminary

2.6 2018 Critical Values

Because design values are calculated using the three most recent calendar years of data, the 2018 4th high to maintain the NAAQS can be back calculated. These critical values are listed in Table 2.5.

Table 2.5
Maximum 2018 4th High 8-Hour Ozone Averages Required for Maintenance

Year	Incline	Lemmon Valley	Reno3***	South Reno	Spanish Springs	Sparks	Toll
2016	0.062	0.072	0.070	0.070	-	0.070	0.069
2017*	0.064	0.069	0.067	0.066	0.068	0.069	0.068
2018	0.086	0.071	0.075	0.076	-	0.073	0.075
DV**	0.070	0.070	0.070	0.070	-	0.070	0.070

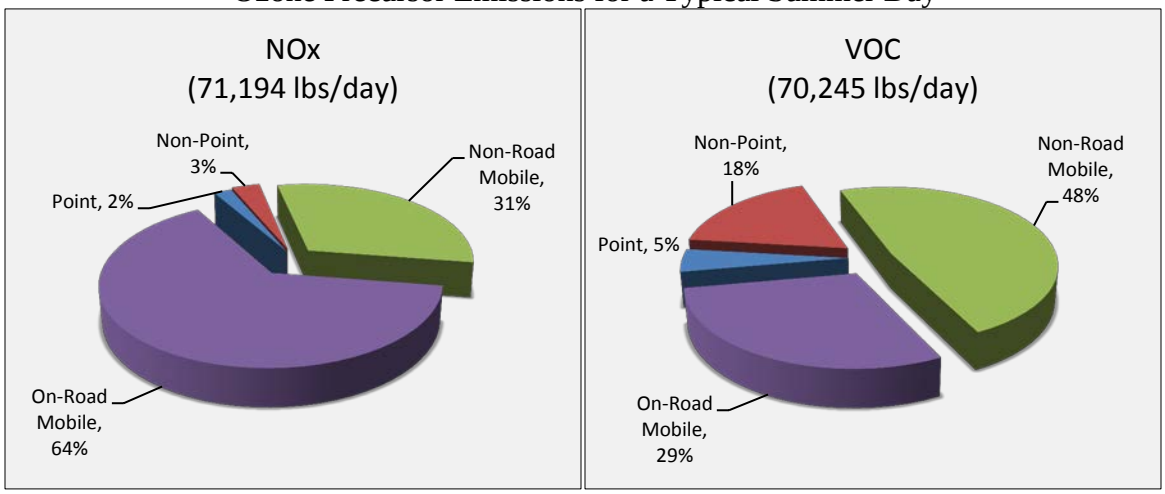
* Preliminary
** Annual 4th highest daily maximum 8-hr concentration, averaged over 3 years
*** Excludes data associated with EPA's concurrence of wildfire ozone exceptional events demonstrations for 2015 (August 18, 19, 21) and 2016 (July 2, 3, 4).

2.7 Sources of Ozone Precursors

Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents as well as natural sources emit oxides of nitrogen (NO_x) and volatile organic compounds (VOC) that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form in harmful concentrations. As a result, it is known as a summertime air pollutant.

Mobile sources (on-road and non-road) are the largest categories of ozone precursors. Figure 2.4 illustrates the ozone planning inventory, which represents NO_x and VOC emissions for a typical summer day. In comparison to the 2011 inventory, NOx emissions have decreased (- 17.1 percent) while VOC emissions have remained steady (- 0.4 percent).

Figure 2.4
Ozone Precursor Emissions for a Typical Summer Day



Source: 2014 Washoe County Periodic Emissions Inventory

3.0 RECENT OZONE ADVANCE INITIATIVES

3.1 Background

When EPA strengthened in the ozone NAAQS from 0.08 to 0.075 ppm in 2008, the AQMD recognized the importance of voluntary initiatives to maintain air quality standards. AQMD actively participated in committees to improve long-term ozone levels targeting opportunities in technology, behavior, and the built environment.

Voluntary initiatives were reemphasized after the NAAQS was further strengthened in 2015 from 0.075 to 0.070 ppm. Washoe County's 2014 ozone design value, which included data from 2012-2014, was 0.070 ppm. The design value was affected by the Great Recession which slowed growth in ozone precursor sources such as VMT, manufacturing, and construction.

After acceptance into the Ozone Advance program in 2016, these voluntary initiatives continued through adopted resolutions by key governing boards including the:[4]

- Washoe County District Board of Health
- Regional Planning Governing Board
- City of Reno
- City of Sparks
- Board of County Commissioners
- Regional Transportation Commission (RTC) of Washoe County

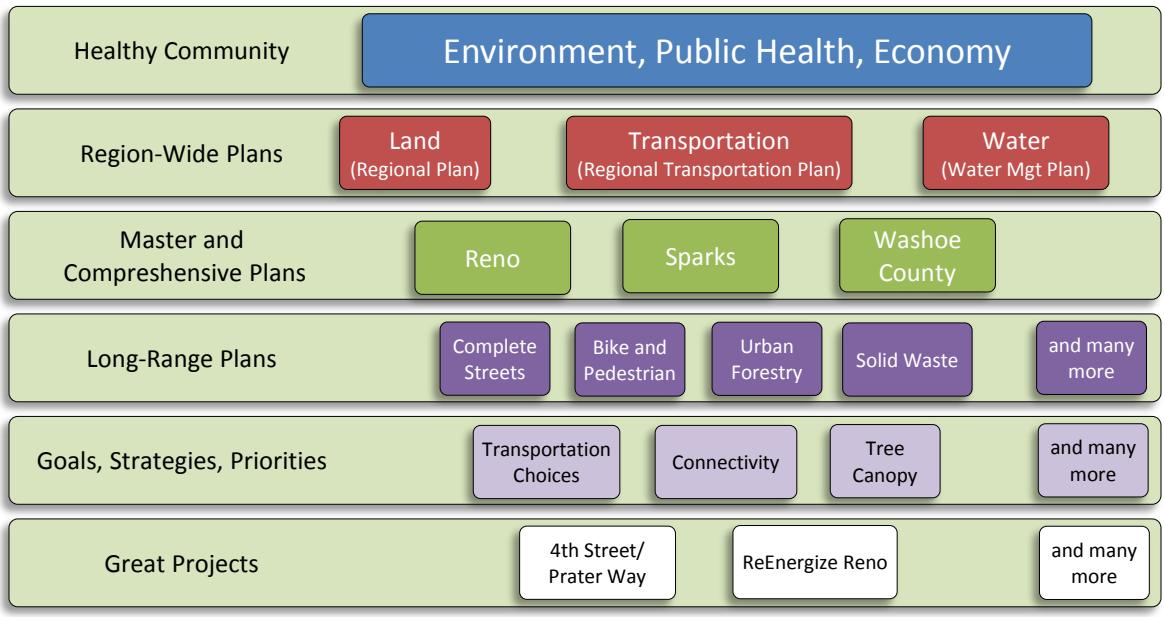
These boards geographically represent the entire county with a strong emphasis on the urbanized portions of the Reno/Sparks area. Their commitment to Ozone Advance allows their strategic plans, departments, and programs to implement initiatives needed for a Healthy Community.

3.2 Top Down Support

Great projects do not happen by accident. It takes commitment and leadership as demonstrated by the adopted resolutions supporting Ozone Advance by governing boards listed in Section 3.1. Governing boards lay the groundwork through region-wide plans, master plans, comprehensive plan, and other long-range plans. These plans incorporate Ozone Advance in their goals, strategies, and priorities. Figure 3.1 illustrates the relationship of projects to region-wide plans. Projects must support, or conform, to plans. Two examples of great projects demonstrating how collective impact can support a Healthy Community are: 1) 4th Street/Prater Way Project,[5] and 2) ReEnergize Reno.[6] These projects support air quality improvements through technology, behavior, and the built environment.

[4] See "Washoe County Health District, Air Quality Management Division, Ozone Advance Path Forward", Appendix B, February 2, 2017. Also available at www.epa.gov/advance/program-participants-washoe-county-nv.
[5] www.rtcwashoe.com/engineering-project/4th-streetprater-way-bus-rapid-transit-project/
[6] www.reno.gov/residents/sustainability/reenergize-reno

Figure 3.1
Top Down Support of Great Projects



AQMD staff has actively participated in development of the following selected recent plans to ensure inclusion of Ozone Advance goals and benefits.

Region-Wide Plans

1. "2040 Regional Transportation Plan" adopted by the RTC of Washoe County on May 18, 2017. (www.rtcwashoe.com/mpo-projects/rtp/)
2. "FFY2018-2022 Regional Transportation Improvement Plan" adopted by the RTC of Washoe County on August 17, 2017. (www.rtcwashoe.com/wp-content/uploads/2017/02/FFY-2018-2022-RTIP-Draft-Document_Final.pdf)

Master and Comprehensive Plans

1. "City of Reno Master Plan", adopted by the Reno City Council on December 13, 2017. (www.reno.gov/government/departments/community-development-department/master-plan)
2. "Ignite Spark: City of Sparks Comprehensive Plan", Certified by the Sparks City Council on October 24, 2016. (http://cityofsparks.us/departments/planning-and-zoning/)

Long-Range Plans

1. "Urban Forestry Management Plan" approved by the Reno City Council on May 25, 2016. (www.reno.gov/government/departments/parks-recreation-community-services/parks-trails/urban-forestry)
2. "Complete Streets Master Plan" approved by the RTC of Washoe County on July 15, 2016. (www.rtcwashoe.com/mpo-projects/complete-streets-master-plan/)
3. "Bicycle and Pedestrian Master Plan" adopted by the RTC of Washoe County on June 15, 2017. (www.rtcwashoe.com/mpo-projects/renosparks-bicycle-pedestrian-plan/)

4. "RTC of Washoe County Sustainability Plan" adopted by the RTC of Washoe County on June 15, 2017. (www.rtcwashoe.com/mpo-reports/sustainability/)

Policies

1. Washoe County School District (WCSD) - Policy 7400 (Conservation and Sustainability) adopted by the WCSD Board of Trustees on June 6, 2017. (www.wcsdpolicy.net//pdf_files/board_policy/7400%20Policy%20-%20Sustainability%20v1.pdf)

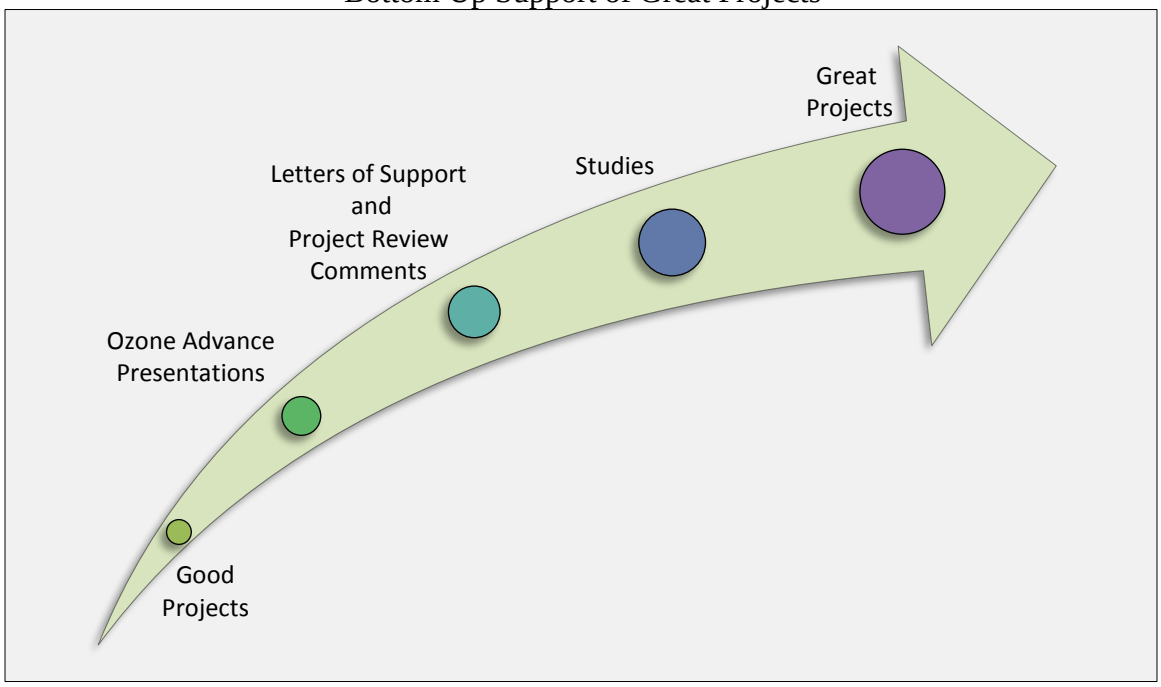
Priorities

1. Reno City Planning Commission 2017 Goals accepted by the Reno City Council on April 12, 2017. (http://renocitynv.iqm2.com/Citizens/Calendar.aspx) April 12, 2017 Reno City Council Meeting - Regular, Agenda Item B.6.

3.3 Bottom Up Support

AQMD has also supported great projects through studies, letters of support, project review comments, and presentations. Incorporating Ozone Advance goals early in the planning process can result in benefits that make good projects even better.

Figure 3.2
Bottom Up Support of Great Projects



AQMD staff has actively participated in development of the following selected recent studies, letters of support, project review comments, and presentations to ensure inclusion of Ozone Advance goals and benefits.

Studies

1. "North Valleys Multimodal Transportation Study" approved by the RTC of Washoe County on February 16, 2017 (www.rtcwashoe.com/mpo-corridor-plan/north-valleys-regional-transportation-study/)
2. "Truckee Meadows Bike Share Feasibility Study" received by the RTC of Washoe County on September 17, 2017. (www.rtcwashoe.com/mpo-reports/bike-share-feasibility-study/)

Letters of Support and Project Review Comments

1. April 2016 support under District Health Officer Kevin Dick's signature for a US Department of Transportation Tiger grant application for "The RTC Washoe Electric Bus Initiative Capital Project". This $16 million project includes 15 all-electric zero-emission busses, 3 overhead chargers at the RTC 4th Street Station, 15 plug-in chargers at the RTC Villanova Maintenance Facility, Smart Charging controllers, and supplemental battery storage packs at the 4th Street Station and Villanova Facility. (www.rtcwashoe.com/mpo-reports/2016-tiger-grant-application-for-the-rtc-washoe-electric-bus-initiative/)
2. August 2016 support under District Health Officer Kevin Dick's signature for a U.S. Department of Transportation Tiger grant application for the "Virginia Street Bus Rapid Transit Extension" project. (www.rtcwashoe.com/mpo-reports/virginia-street-bus-rapid-transit-extension-project-tiger-2017/)
3. June 2017 support under District Health Officer Kevin Dick for RTC's proposal for the Federal Transit Administration FY17 Low or No Emission (Low-No) Vehicle Program. This $2.5 million project includes seven electric busses to replace existing diesel powered busses. (www.rtcwashoe.com/mpo-reports/2016-tiger-grant-application-for-the-rtc-washoe-electric-bus-initiative/)
4. July 2017 comments under AQMD Director Charlene Albee's signature regarding the StoneGate Master Plan Amendment and PUD Zoning Map Amendment. (http://renocitynv.iqm2.com/Citizens/Detail_Meeting.aspx?ID=1712 - Agenda Item 6)
5. December 2017 support under AQMD Director Charlene Albee's signature for Nevada GOE's proposal for a U.S. DOE grant to port energy data from NVEnergy directly into ENERGY STAR Portfolio Manager.
6. January 2018 support under AQMD Director Charlene Albee's signature for a Western Nevada College proposal for an EPA grant for creation of a database to collect environmental measures from Nevada businesses.
7. Comments under AQMD Director Charlene Albee's signature regarding various City of Reno affordable housing projects.

Presentations

1. Presentations to various governing boards, planning commissions, and professional organizations on the Ozone Advance program.

3.4 Other Initiatives

Keep it Clean is AQMD's award winning[7] outreach program to inform and empower the community to improve air quality issues. The "nOzone" campaign under Keep it Clean provides information specific to ozone. During the 2017 ozone season, AQMD distributed three to five nOzone messages per week via social media.

3.5 Committees

AQMD actively participated on the following selected committees to ensure top down and bottom up support of great projects.

- RTC Technical Advisory Committee
- Advisory Committee on the Control of Emissions from Motor Vehicles
- Reno Master Plan Update Committee
- Nevada Chapter of the American Planning Association
- Sustainability Partners for Northern Nevada
- Safe Routes to School Working Group
- Truckee Meadows Bicycle Alliance
- Washoe County Green Team

[7] 2014 EPA Greg Cooke Visionary Award (www.epa.gov/caaac/clean-air-excellence-award-recipients).

4.0 KEY PERFORMANCE INDICATORS

4.1 Background

Key Performance Indicators (KPI) are used to benchmark progress towards achieving Ozone Advance goals. The ultimate KPI for success is ozone design values. Other KPI's are strongly connected to solutions that improve air quality. For example, increasing active tranportation options (miles of bikeways) changes the travel mode splits, which increases physical activity, which improves chronic disease rates.

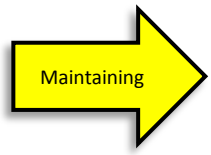
Following are KPI's that contribute to a successful Ozone Advance program. Each KPI has a description and icon summarizing the trend for this indicator. They are categorized into four groups. Detailed KPI data and trends are included in Appendix B.

1. Ultimate KPI: The design value is the "pass/fail" (aka, "attainment/non-attainment) grade EPA assigns based on ozone monitoring data.
2. Primary KPI: The Ozone Advance Path Forward Plan concentrates on improving these indicators because they have a strong connection to improving ozone concentrations. Incorporating Ozone Advance into local plans, policies, and programs provides support to improve these indicators.
3. Secondary KPI: This group of indicators realizes co-benefits from improving Primary KPI's. They are important indicators for a Healthy Community.
4. Associated KPI: These indicators are not directly influenced by Ozone Advance, but are associated with long-term trends in ozone concentrations.

4.2 Ultimate KPI

This is the KPI that measures compliance with the ozone NAAQS and success of the Ozone Advance program.

4.2.1 Design Value



The goal of Ozone Advance is to reduce ozone precursor emissions and prevent violations of the ozone NAAQS. This is the KPI that measures the overall success of the Ozone Advance program. Design values are described in detail in Section 2.0.

4.3 Primary KPI's

Ozone Advance emphasizes plans, policies, and programs that support improvement of these indicators. The following KPI's have a strong connection to ozone concentrations. "Improving" KPI's reduce ozone precursor emissions, while "Worsening" indicators can contribute to higher ozone levels.

4.3.1 Transportation

On-road motor vehicles are the largest category of ozone precursors in Washoe County, which is common for areas without power plants. These KPI's measure progress towards the Ozone Advance Path Forward Plan's Goal 1, Strategies 1 (Minimize VMT and trips) and 2 (Reduce per mile tailpipe emissions from on-road motor vehicles).

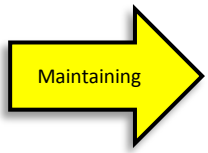
4.3.1.1 Vehicle Miles Traveled

Controlling Vehicle Miles Traveled (VMT) will have the greatest impact to maintaining the ozone NAAQS. Long-term strategies are focused on shaping the built environment to increase transportation options other than driving, especially driving alone. Regional VMT continues to increase, however, it is forecast to increase at a slower rate.

4.3.1.2 Per Capita VMT

As the population of the region increases, per capita VMT will become an important KPI to measure progress towards reducing impacts from motor vehicle transportation. Per capita VMT has been increasing, however, it is forecast to be decreasing through 2022.

4.3.1.3 Travel to Work Mode Splits



Regional land use patterns influence our travel to work choices and habits. Traveling by automobile is the predominant choice and the drive alone rate has been consistently been 77-78 percent since 2010. The RTC has conducted two household travel surveys - one in 2005 and the other in 2015-2016. Because of this small data set, travel to work mode splits were obtained from the U.S. Census Bureau, American Fact Finder reports.

4.3.1.4 Transit Ridership

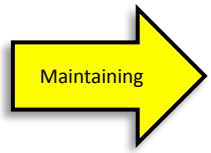
Transit is an essential part of the local economy that helps thousands of Washoe County residents get to work each day. Transit helps shape development patterns and is an economic development tool that supports local Transit Oriented Development zoning and land use policies. In addition, transit provides a critical public service to residents and visitors that do not drive. The environmental benefits of transit service are also well recognized: reducing the number of cars on the road reduces traffic congestion and air pollution. Although

population continues to increase, ridership has declined every year since peaking in 2014.

4.3.1.5 Vanpools

A vanpool is generally a group of between 5 to 15 people with similar travel patterns who ride to work or other places together in a shared vehicle (most often a van). The RTC manages vanpools through their SMART TRIPS program. The number of vanpools and VMT reduced has consistently increased since 2010.

4.3.1.6 Smog Check Program



On-road motor vehicles are the largest category of ozone precursors in Washoe County. The great majority are light-duty gasoline powered cars and trucks. These vehicles from model year 1968 and after are subject to inspections (smog checks) to ensure their emission control systems are operating properly. Initial test failure rates are a good indicator of the program's effectiveness. Model year 1968-95 vehicles are tested by measuring pollutants emitted from the tailpipe. Model year 1996- present vehicles are tested by checking the on-board diagnostics. The trend in initial test failure rates has been level to slightly improving.

4.3.1.7 Clean Fleets

On-road heavy-duty diesel vehicles are a large source of ozone precursors (NOx and VOC) and particulates. Three of the larger and more impactful fleets are public transit, school busses, and waste collection. Public transit supports many other Ozone Advance and sustainability goals. School busses transport children and young adults. These populations are more vulnerable to lower air pollution concentrations. Waste collection trucks travel through every neighborhood in the county.

Federal standards will improve overall tailpipe emissions through natural attrition of vehicles, however, diesel engines are durable and can operate for decades. The RTC, WCSD, and Waste Management have made the business case to accelerate retirement of their older, higher polluting heavy-duty diesel vehicles and incorporate cleaner alternatives. Washoe County's public transportation fleet is moving towards electric, the school district emphasizes propane, and Waste

Management has added dozens of CNG trucks. Fleet managers have also utilized federal, regional, and state funding opportunities to improve their fleets.

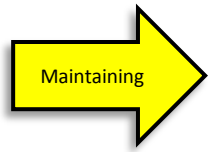
4.3.1.8 Hybrid and Electric Vehicles

These vehicles have much lower tailpipe emissions than conventional gasoline and diesel powered vehicles. Technology has also improved their efficiency compared to first generation vehicles. Registered hybrid and electric vehicles in Washoe County has steadily increased.

4.3.1.9 Electric Vehicle Charging Infrastructure

Electric vehicle charging stations provide the infrastructure for vehicles to extend the driving range away from their home base. As these vehicles become more common and a larger portion of the fleet, the demand and use of charging stations should increase. Data was compiled by the Nevada Governor's Office of Energy and includes charging stations accessible to the general public. The data are representative of the trend in electric vehicle use in Washoe County. Battery technology is constantly improving which extends the driving range of vehicles. The long-term growth trend in number of charging stations may slow as vehicles will require fewer charges away from home base.

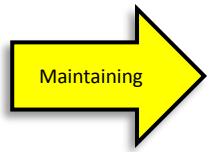
4.3.1.10 Electrified Truck Parking



The number of long-haul trucks traveling through Washoe County has been increasing. Several factors have contributed to this increase in freight/goods movement including: 1) Expansion at the Port of Oakland, California, 2) an increase in distribution and fulfillment centers locating in Washoe County, 3) an increase in distribution and fulfillment centers locating in the region including the Tahoe-Reno Industrial Center, and 4) natural population growth in the United States. Long-haul trucks are an integral factor in freight/goods movement. As truck drivers rest along their cross-country routes, they often leave their trucks idling to power climate controls and accessories. Technology currently exists for these trucks to use shore power to eliminate idling. Of the 607 truck parking spaces currently in Washoe County, zero are set up for shore power technology. Because no changes have occurred to increase the number of electrified truck parking spaces in

Washoe County, the trend in this category can also be considered “worsening”.

4.3.1.11 On-Road Fuel Use

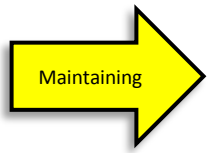


Gasoline and diesel sales are related to on-road motor vehicle use. The increase in VMT also increases fuel use, however, this is somewhat offset by increased efficiency of newer cars and trucks. Fuel use is also reduced as electric vehicles become a larger portion of the motor vehicle fleet.

4.3.1.12 Bikeways

Bikeways are the infrastructure that provide safe opportunities for biking to school, work, and for recreation. These are classified as bike paths, lanes, and routes. This report includes total miles of bikeways and does not separate by classification. Bikeways have been increasing primarily due to local initiatives such as the “Complete Streets Master Plan”, “2040 Regional Transportation Plan”, “Bicycle and Pedestrian Master Plan”, “City of Reno Master Plan”, and the Washoe County School District’s Safe Routes to School program.

4.3.1.13 Bike Friendly America



The League of American Bicyclists has a certification program to recognize communities, businesses, and universities for their efforts to make bicycling a real transportation and recreation option for all people. The Bike Friendly America program not only sets standards for what constitutes a real biking culture and environment, it provides a toolkit of resources to make communities, businesses, and universities even better.

As of 2016, only the RTC, REI (Recreational Equipment, Inc.), and the University of Nevada have been certified by Bike Friendly America.

4.3.2 Energy Efficient Buildings

A significant amount of energy is used to heat and cool buildings. The energy sources emit ozone precursors and greenhouse gasses. Washoe County is recovering from the Great Recession. New building construction has increased throughout this decade. Goal 4 of the Ozone Advance Path Forward is to “Increase efficiency of buildings”. Improving new construction energy efficiency will have permanent, long-term environmental and economic benefits.

4.3.2.1 LEED Certified Buildings

Leadership in Energy and Environmental Design (LEED) is the most widely used green building rating system in the world. LEED provides a framework to create healthy, highly efficient and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement. Not all buildings registered for LEED will meet the requirements to become certified. The trend in the number of LEED certified buildings and square footage has been improving.

4.3.2.2 ENERGY STAR Homes

ENERGY STAR is a federal voluntary program that helps businesses and individuals save money and protect our climate through superior energy efficiency. ENERGY STAR certified homes are: 1) More energy efficient than typical new homes, 2) designed and built to high standards, 3) inspected, tested, and verified, 4) built better from the ground, and 5) more comfortable.

In Nevada, 3,781 of the 11,250 home constructed in 2016 were ENERGY STAR certified. Of these 3,781 homes, ZERO were located in the Reno/Sparks area. Since 2010, fewer than 200 have been constructed in Reno/Sparks. The last ENERGY STAR home constructed in Washoe County was in 2014.

4.3.3 Urban Heat Island (UHI)

Growth and development in Washoe County increases the amount of heat absorbing surfaces, which then contributes to warmer temperatures. Warmer temperatures directly affect ozone concentrations by accelerating ozone formation. Higher temperatures indirectly affect ozone levels by increasing ozone precursor emissions (NOx and VOC). Additional cooling in buildings requires additional energy from sources emitting NOx and VOC. Additional engine loads on cars and trucks are needed to operate air conditioning resulting in additional tailpipe emissions. Higher temperatures accelerate evaporation of VOC from gasoline, paints, and solvents.

4.3.3.1 Tree Canopies and Built Environment Factors

Tree canopies, impervious surfaces, and vegetative surfaces influences how much solar radiation energy is absorbed which would normally be dissipated at night. Tracking factors contributing to Washoe County's UHI provides feedback on the effectiveness of local policies. A 2012 study estimated the tree canopies for the Cities of Reno and Sparks. There are no other data points tracking tree canopies or factors contributing to the UHI.

4.4 Secondary KPI's

The Path Forward Plan goal is to improve indicators listed in the previous section (Primary KPI's). Cumulative impact from the Primary KPI's will influence the following Secondary KPI's.

4.4.1 Climate

The Reno/Sparks area has a long, consistent history of recorded meteorological data. Two KPI's that represent Washoe County's temperature trend are: 1) Cooling degree-days, and 2) number of days over 90^{o}. Both of these KPI's have been trending higher in comparison to 30-year normals.

4.4.2 Chronic Diseases

There is a strong direct and indirect connection between clean air and public health. Chronic diseases such as respiratory illnesses, heart disease, diabetes, and obesity are largely preventable however account for seven out of ten deaths in the United States every year. One in two adults in the United States has a chronic disease, while one in three adults have two or more. Locally, prevalence of adult asthma, Chronic Obstructive Pulmonary Disease (COPD), angina/coronary heart disease, high cholesterol, high blood pressure, diabetes, and obesity are increasing.[8]

Expanding active transportation (walking and biking) choices is an Path Forward Plan initiative to reduce VMT and tailpipe emissions. An additional co-benefit is that chronic disease rates improve as a result from increased physical activity.

[8] "2018-2020 Washoe County Community Needs Assessment", Section 1.16 (Chronic Diseases), January 2018. Available from the Washoe County Health District (www.washoecounty.us/health/index.php).

4.5 Associated KPI's

These indicators do not measure the direct goals of Ozone Advance, but should be included in discussions regarding the health of our community.

4.5.1 Demographics

Population estimates are compiled by the Nevada State Demographer and certified by the Governor. The Regional Planning Governing Board approves 20-year population forecasts for the county. This consensus forecast is used by the AQMD and Metropolitan Planning Organization for developing air quality State Implementation Plans and Regional Transportation Plans.

4.5.2 Economy

A healthy community includes a clean environment, healthy citizens, and a strong economy. Washoe County is recovering economically from the Great Recession as indicated by the trend in Gross Domestic Product.

5.0 STRATEGIES MOVING FORWARD

5.1 Top Down Strategies

The AQMD will continue to reaffirm existing partnerships, especially with those governing boards that adopted resolutions supporting Ozone Advance. This will be accomplished by sharing annual report such as this, and updates directly to the governing boards.

Broad based support of Ozone Advance is essential to improving long-term air quality. AQMD will seek to formalize support from key partners including, but not limited to:

Local Partners

- University of Nevada, Reno
- Truckee Meadows Community College
- WCSD
- Truckee Meadows Water Authority
- Reno-Tahoe Airport Authority
- Reno Sparks Convention and Visitors Association
- Reno Sparks Chamber of Commerce
- Reno-Sparks Indian Colony
- Pyramid Lake Paiute Tribe
- NVEnergy
- Waste Management

Regional and State Partners

- Carson Area Metropolitan Planning Organization
- Carson City
- Storey County
- Nevada System of Higher Education
- Governor's Office of Energy
- Tahoe Regional Planning Agency
- Nevada Department of Transportation
- American Planning Association, Nevada Chapter
- Builders Association of Northern Nevada
- Nevada Builders Alliance
- Associated General Contractors, Nevada Chapter
- American Society of Landscape Architects, Nevada Chapter
- Economic Development Authority of Western Nevada
- Reno-Tahoe Clean Cities Coalition
- Southwest Energy Efficiency Project (SWEEP)
- FleetPros
- Nevada Trucking Association

Support from these partners can have long-term air quality benefits via their strategic plans, goals, and priorities.

5.2 Bottom Up Strategies

The AQMD will continue to:

1. Actively participate on the following committees to ensure Ozone Advance goals are included their decisions:
   - RTC Technical Advisory Committee
   - Advisory Committee on the Control of Emissions from Motor Vehicles
   - Nevada Chapter of the American Planning Association
   - Sustainability Partners for Northern Nevada
   - Safe Routes to School Working Group
   - Truckee Meadows Bicycle Alliance
   - Washoe County Green Team
2. Provide comments supporting long-term air quality goals on proposed:
   - Affordable housing projects
   - Significant land use projects (i.e., StoneGate (aka Heinz Ranch) and Daybreak (aka Butler Ranch))
3. Provide letters of support for proposals that directly or indirectly support Ozone Advance goals.
4. Present information about Ozone Advance to boards, committees, professional organizations, and other groups that can influence positive improvements to the KPI's described in Section 4.0.

5.3 Additional Initiatives

Following are initiatives supporting Ozone Advance that are expected to be implemented, or completed, in 2018. These are in addition to current ongoing initiatives.

- A Truckee Meadows Regional Planning Agency sponsored "Regional Sustainability Study" is expected to be completed and then accepted by the Regional Planning Governing Board. The study will provide information for the Regional Plan Update.
- A proposal through NASA's DEVELOP[9] capacity building program to measure factors contributing to Washoe County's UHI is expected to be awarded in Spring/Summer. This will provide a methodology to measure UHI factors (i.e., tree canopy, impermeable surfaces, vegetative surfaces) more frequently using NASA products and resources. Results will support Ozone Advance Path Forward Goal 4 (Reduce impacts from heat island effects that contribute to ozone formation), and Reno's Master Plan Guiding Principle 7 (Quality Places and Outdoor Recreation Opportunities).
- The AQMD is expected to acquire an infrared camera to detect fugitive VOC leaks from facilities such as gasoline dispensing facilities, tank farms, and geothermal plants. This tool will provide opportunities for staff and industry to assess and reduce excess emissions.
- Applications for the Volkswagen Settlement funds are expected to be accepted in Spring/Summer with the first projects being awarded in late 2018/early 2019. Funds will be awarded based on weighting of specific criteria such as ozone attainment status, NOx emissions, and population.

[9] https://develop.larc.nasa.gov/.

5.4 Growth-Related Area of Focus

Washoe County and the surrounding region is rebounding from the Great Recession and experiencing growth in population, VMT, and the economy. New communities are being developed to meet the demand from growth. The WCSD is planning to build 15 new schools (Nine elementary, three middle, and three high schools) by 2025. These new schools will define its surrounding neighborhoods. Active transportation infrastructure will be critical to provide safe choices for the hundreds of students attending each school. The two most significant factors determining students' likelihood of walking or cycling to school are the: 1) Distance from home to school, and 2) quality of built environments between home and school.[10] A great school location provides transportation choices and can reduce the need for school bus routes.

The WCSD can be viewed as the largest "employer" in the county. Over 65,000 students and 8,000 staff need to travel to 100 "work" sites each school day. The majority of students do not travel by school bus. Bus transportation is not provided within Walk Zones, which are generally one mile around elementary, two miles around middle, and three miles around high schools. Initiatives and programs focused on reducing the number of students traveling by car will have great benefits on the environment and chronic disease rates. The importance of school siting and active transportation is reaffirmed by the City of Reno's Planning Commission 2017 priorities.

5.5 Other Factors

Forecasted improvements in ozone levels will also be dependent on federal strategies implemented nationally. If sources affected by relaxation of a federal strategy are located outside of Washoe County, transport of the resulting emissions will have an impact on Washoe County's ozone concentrations and design value. AQMD will continue to engage in the development of national strategies to reduce impacts that could delay or jeopardize maintenance of the ozone NAAQS.

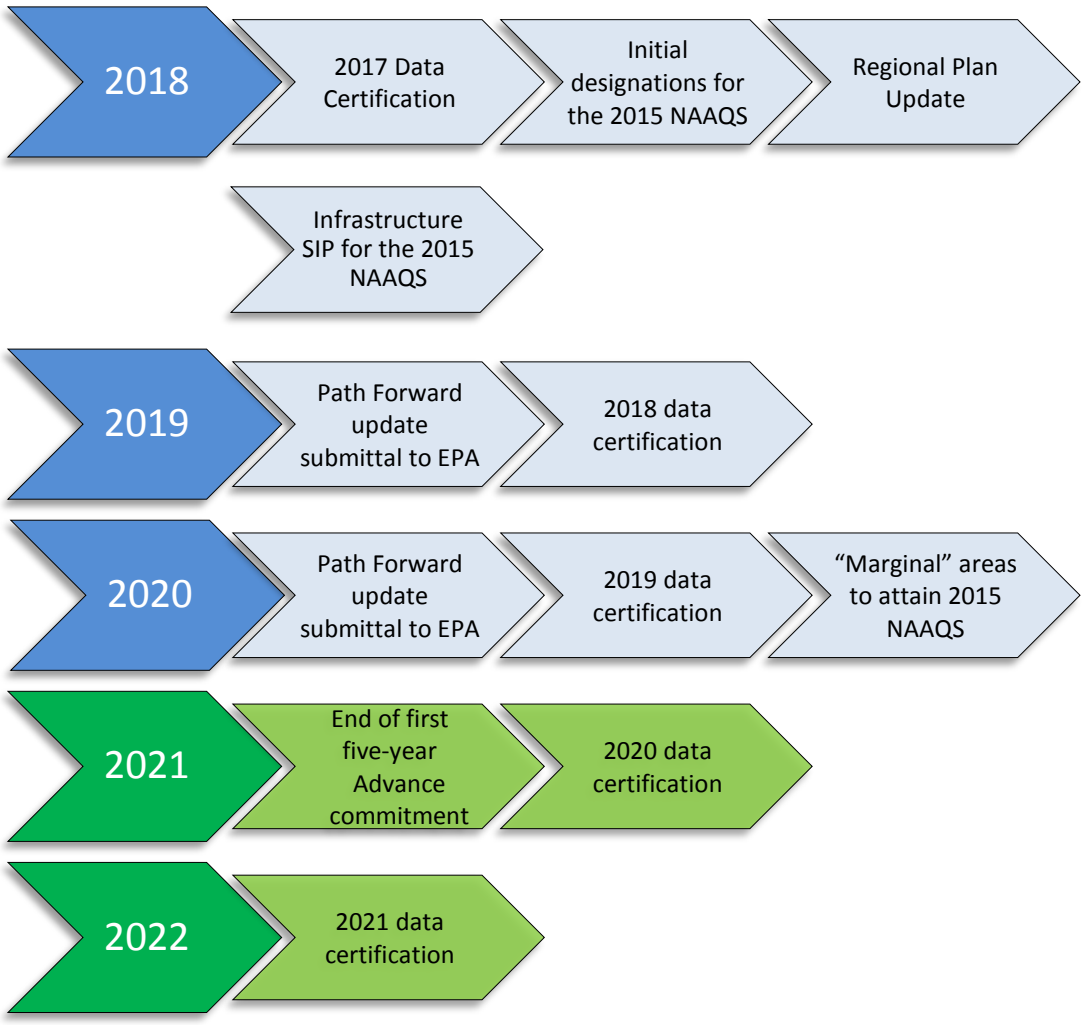
[10] Inouye, D., Berry, K. 2008. Assessing Bikeway Networks around Public Schools: A Tool for Transportation Planning in Washoe County, Nevada. *Planning, Practice & Research*, 23(2): 229-247. Taylor & Francis Online (www.tandfonline.com/doi/abs/10.1080/02697450802327164)

6.0 MILESTONES AND DEADLINES

6.1 Upcoming Milestones and Deadlines

Implementation of the ozone NAAQS has specific scheduled requirements. Below are key milestones related to Ozone Advance and maintaining the NAAQS.

Figure 6.1
Milestones (2018-2022)



Appendix A

Letter from EPA to Governor Sandoval Regarding Ozone Designations
dated December 20, 2017

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

DEC 20 2017

The Honorable Brian Sandoval
Governor of Nevada
State Capitol Building, 101 North Carson Street
Carson City, Nevada 89701

Dear Governor Sandoval:

Thank you for your recommendation dated September 22, 2016, on air quality designations for the revised 2015 National Ambient Air Quality Standards (NAAQS) for ozone throughout Nevada. I appreciate the information Nevada shared with the U.S. Environmental Protection Agency (EPA) as we move forward to improve ozone air quality. This letter is to notify you of the EPA's preliminary response to Nevada's recommendations and to inform you of our approach for completing designations for the revised ozone standards. After considering Nevada's September 22, 2016 ozone designation recommendations, which were based on 2013-2015 air quality data, as well as other relevant technical information, the EPA intends to designate a portion of Clark County as Nonattainment, as listed in Enclosure 1. We intend to modify the State's recommendation for this area. The EPA also intends to designate all other areas in the State not previously designated in November 2017 as Attainment/Unclassifiable.

On October 1, 2015, the EPA lowered the primary 8-hour ozone standard from 0.075 parts per million (ppm) to 0.070 ppm to provide increased protection of public health. The EPA revised the secondary 8-hour ozone standard, making it identical to the primary standard, to protect against welfare effects, including impacts on sensitive vegetation and forested ecosystems. Working closely with the states and tribes, the EPA is implementing the standards using a common sense approach that improves air quality and minimizes the burden on state and local governments. As part of this routine process, the EPA is working with the states to identify areas in the country that meet the standards and those that need to take steps to reduce ozone pollution.

As a first step in implementing the 2015 ozone standards, the EPA asked states to submit in the fall of 2016 their designation recommendations, including appropriate area boundaries. A first round of designations was published on November 16, 2017. Consistent with states' recommendations, the EPA designated most of the country as Attainment/Unclassifiable, with limited areas designated as Unclassifiable. Further, consistent with EPA's "Policy for Establishing Separate Air Quality Designations for Areas of Indian Country" (December 20, 2011), the EPA designated two areas of Indian country as separate Attainment/Unclassifiable areas.

As required by the Clean Air Act, the EPA will designate an area as Nonattainment if there are certified, quality-assured air quality monitoring data showing a violation of the 2015 ozone standards or if the EPA makes a determination that the area is contributing to a violation of the standards in a nearby area.

Areas designated Attainment/Unclassifiable are not measuring or contributing to a violation of the standards.

A Technical Support Document, available on the EPA ozone designations website at www.epa.gov/ozone-designations/, provides a detailed analysis to support our preliminary decisions for the areas of the State not previously designated, and discusses our intended modification to the State's recommended nonattainment area for Clark County. In order for the EPA to consider more current (i.e., 2015-2017) air quality data in the final designation decisions for any area, Nevada must submit certified, quality-assured 2015-2017 air quality monitoring data for the area to the EPA by February 28, 2018.

The EPA will continue to work with state officials regarding the appropriate boundaries for the Nonattainment areas in Nevada. If Nevada has additional information that you would like the EPA to consider, please submit it to us by February 28, 2018. Please submit additional information by sending it to the EPA's public docket for these designations, EPA-HQ-OAR-2017-0548, located at www.regulations.gov, and sending a copy to EPA Region 9. The EPA will also make its preliminary designation decisions and supporting documentation available to the general public for review and comment. We will be announcing a 30-day public comment period shortly in the *Federal Register*. After considering additional information we receive, the EPA plans to promulgate final ozone designations in spring of 2018.

The EPA is committed to working with the states and tribes to reduce ozone air pollution. We look forward to a continued dialogue with you and your staff as we work together to implement the 2015 ozone standards. Should you have any questions regarding this matter, please do not hesitate to contact me at 415-947-8702 or have a member of your staff contact Meredith Kurpius at 415-947-4534.

Sincerely,

Alexis Strauss

Alexis Strauss 20 Dec. 2017
Acting Regional Administrator

Enclosure

cc (via e-mail): Greg Lovato, Administrator, Nevada Division of Environmental Protection (NDEP)
Jeffrey Kinder, Deputy Administrator, NDEP

Enclosure 1

Nevada State and Tribal Recommended Nonattainment Areas and the EPA's Intended Designated Nonattainment Areas for the 2015 Ozone NAAQS.

Area	Nevada's or Tribe's Recommended Nonattainment Counties [or Areas of Indian Country]	EPA's Intended Nonattainment Counties [or Areas of Indian Country]
Las Vegas, NV*	Clark County (partial)	**Clark County (partial)**
• Las Vegas Tribe of Paiute Indians	• did not submit recommendation	• Las Vegas Tribe of Paiute Indians

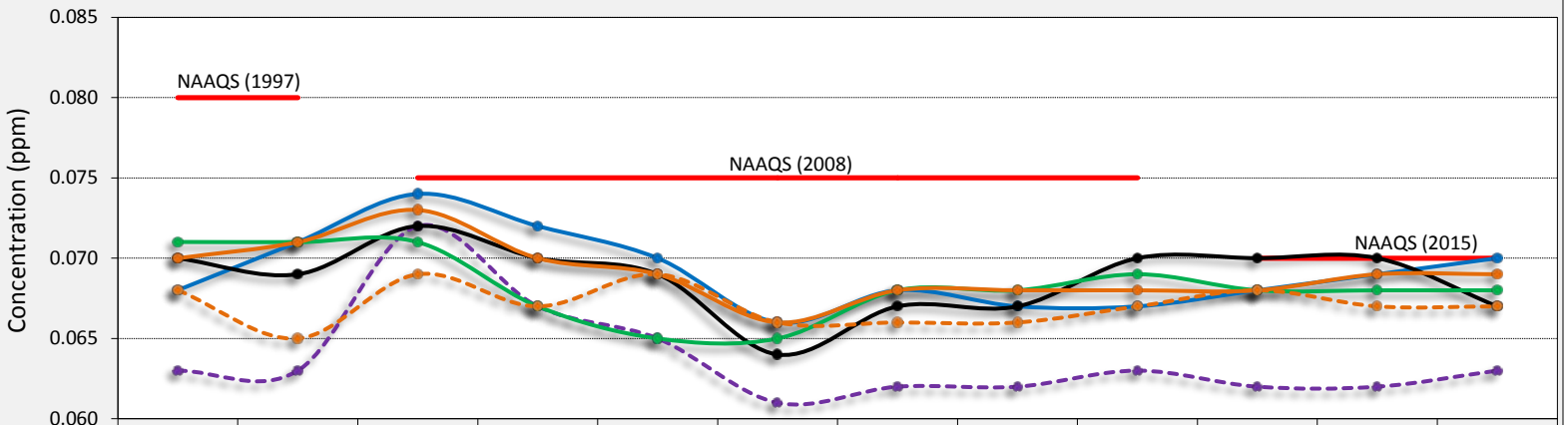
EPA modifications to state or tribal recommendations are shown in **bold**.

*Las Vegas is a multi-jurisdictional nonattainment area that include areas of Indian country of federally-recognized tribes. The areas of Indian country of each tribe that the EPA intends to designate as part of the nonattainment area are discussed in the Technical Support Document for Nevada, which is available on the EPA ozone designations website at https://www.epa.gov/ozone-designations/.

Appendix B

Key Performance Indicators

Figure B.1
Ultimate KPI: Design Value Trend



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
NAAQS	0.08	0.08	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.070	0.070	0.070
Incline	0.063	0.063	0.072	0.067	0.065	0.061	0.062	0.062	0.063	0.062	0.062	0.063
Lemmon Valley	0.068	0.071	0.074	0.072	0.070	0.066	0.068	0.067	0.067	0.068	0.069	0.070
Reno*	0.070	0.069	0.072	0.070	0.069	0.064	0.067	0.067	0.070	0.070	0.070	0.067
South Reno	0.071	0.071	0.071	0.067	0.065	0.065	0.068	0.068	0.069	0.068	0.068	0.068
Spanish Springs	-	-	-	-	-	-	-	-	-	-	-	-
Sparks	0.070	0.071	0.073	0.070	0.069	0.066	0.068	0.068	0.068	0.068	0.069	0.069
Toll	0.068	0.065	0.069	0.067	0.069	0.066	0.066	0.066	0.067	0.068	0.067	0.067

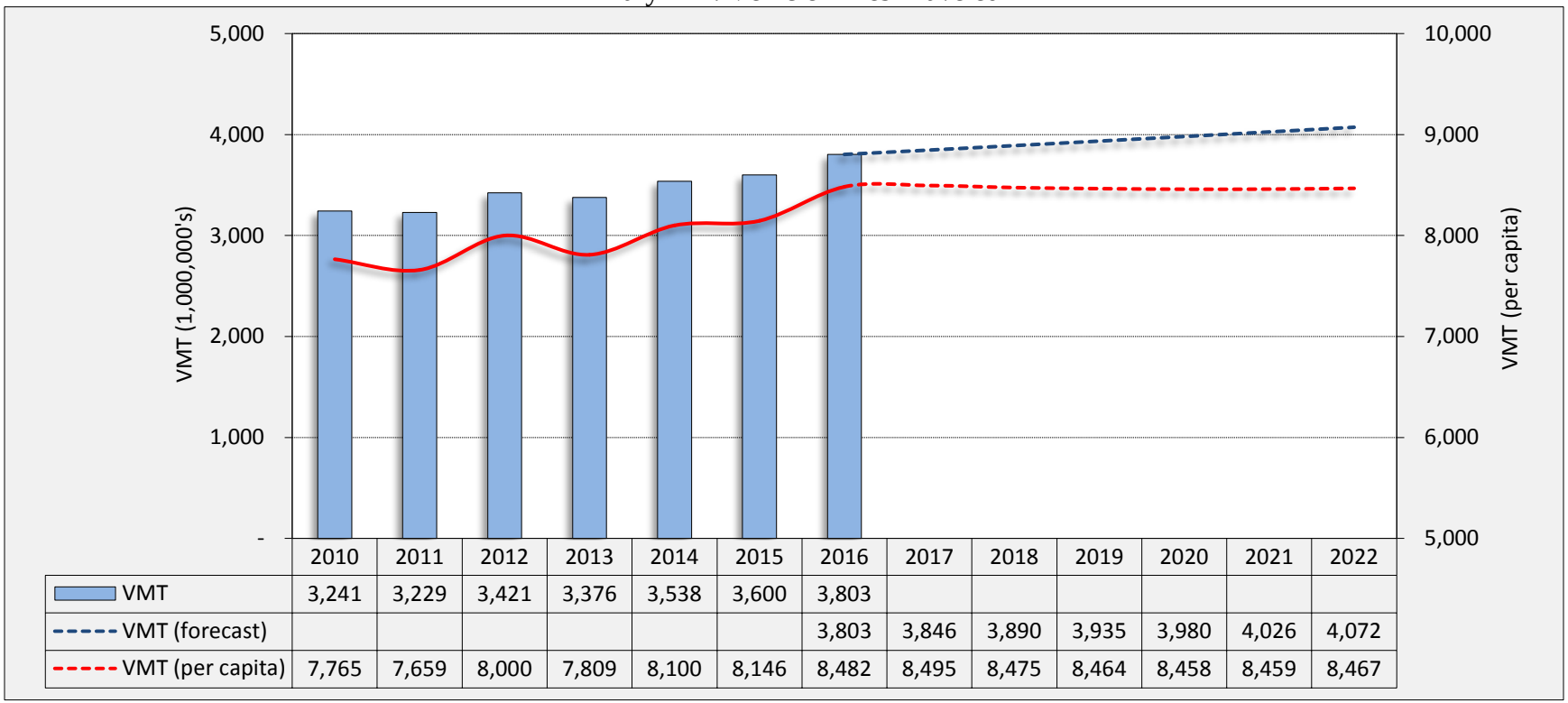
*Note: Reno Design Values are calculated with EPA's concurrence of wildfire ozone exceptional events demonstrations for 2015 (August 18, 19, 21) and 2016 (July 2, 3, 4).

Improvement looks like: Design value <= 0.070 and downward trend in design values.

References:

1. U.S. Environmental Protection Agency, Air Quality System.

Figure B.2
Primary KPI: Vehicle Miles Traveled



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
VMT	3,241	3,229	3,421	3,376	3,538	3,600	3,803						
VMT (forecast)							3,803	3,846	3,890	3,935	3,980	4,026	4,072
VMT (per capita)	7,765	7,659	8,000	7,809	8,100	8,146	8,482	8,495	8,475	8,464	8,458	8,459	8,467

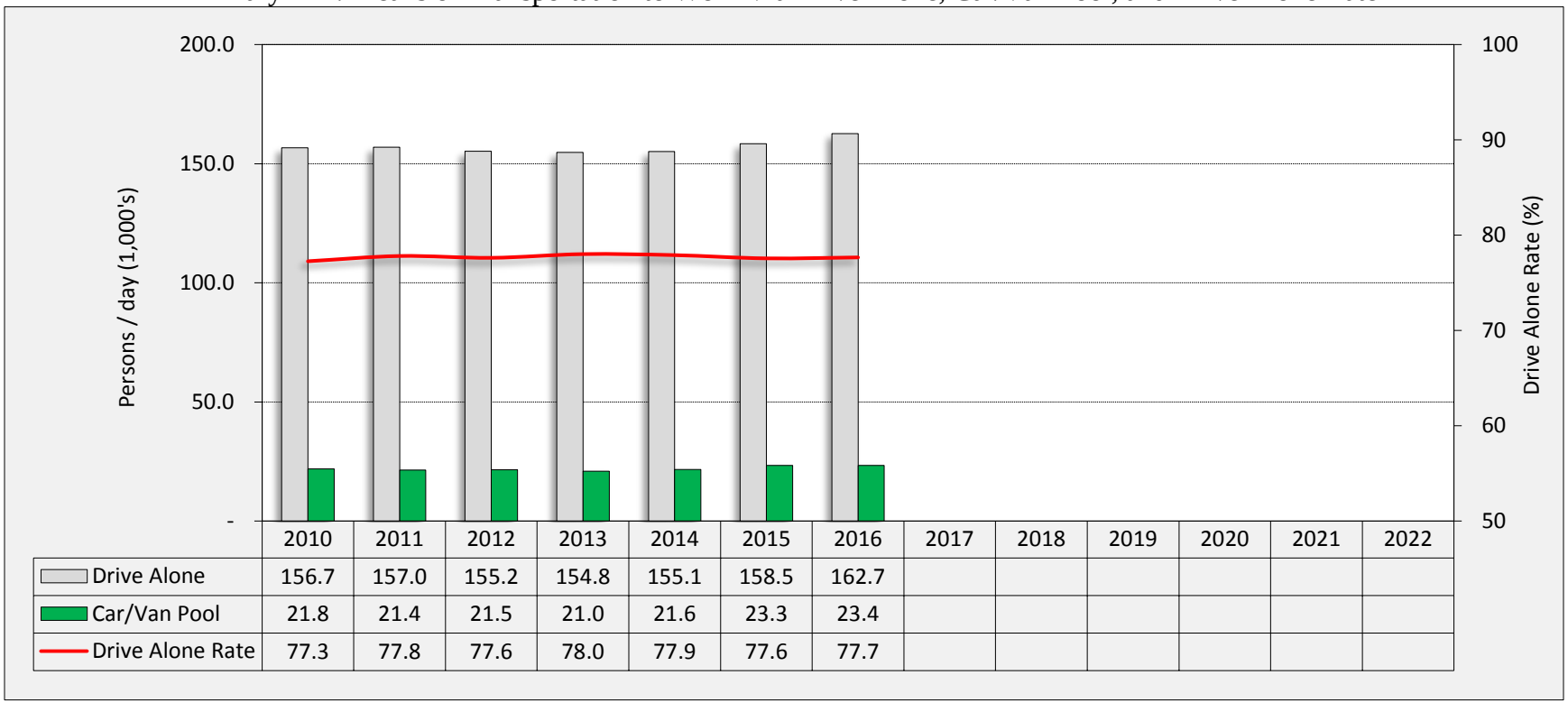
Improvement looks like:

- VMT and per capita VMT decreasing, or increasing at a slower rate.

References:

1. 2010-2016 VMT: Nevada Department of Transportation, Planning Division, "Annual Vehicle Miles of Travel Report (www.nevadadot.com/doing-business/about-ndot/ndot-divisions/planning/roadway-systems/annual-vehicle-miles-of-travel)
2. 2017-2022 Growth Rates: Regional Transportation Commission of Washoe County, "2040 Regional Transportation Plan" Adopted May 18, 2017

Figure B.3
Primary KPI: Means of Transportation to Work Via Drive Alone, Car/Van Pool, and Drive Alone Rate



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Drive Alone	156.7	157.0	155.2	154.8	155.1	158.5	162.7						
Car/Van Pool	21.8	21.4	21.5	21.0	21.6	23.3	23.4						
Drive Alone Rate	77.3	77.8	77.6	78.0	77.9	77.6	77.7						

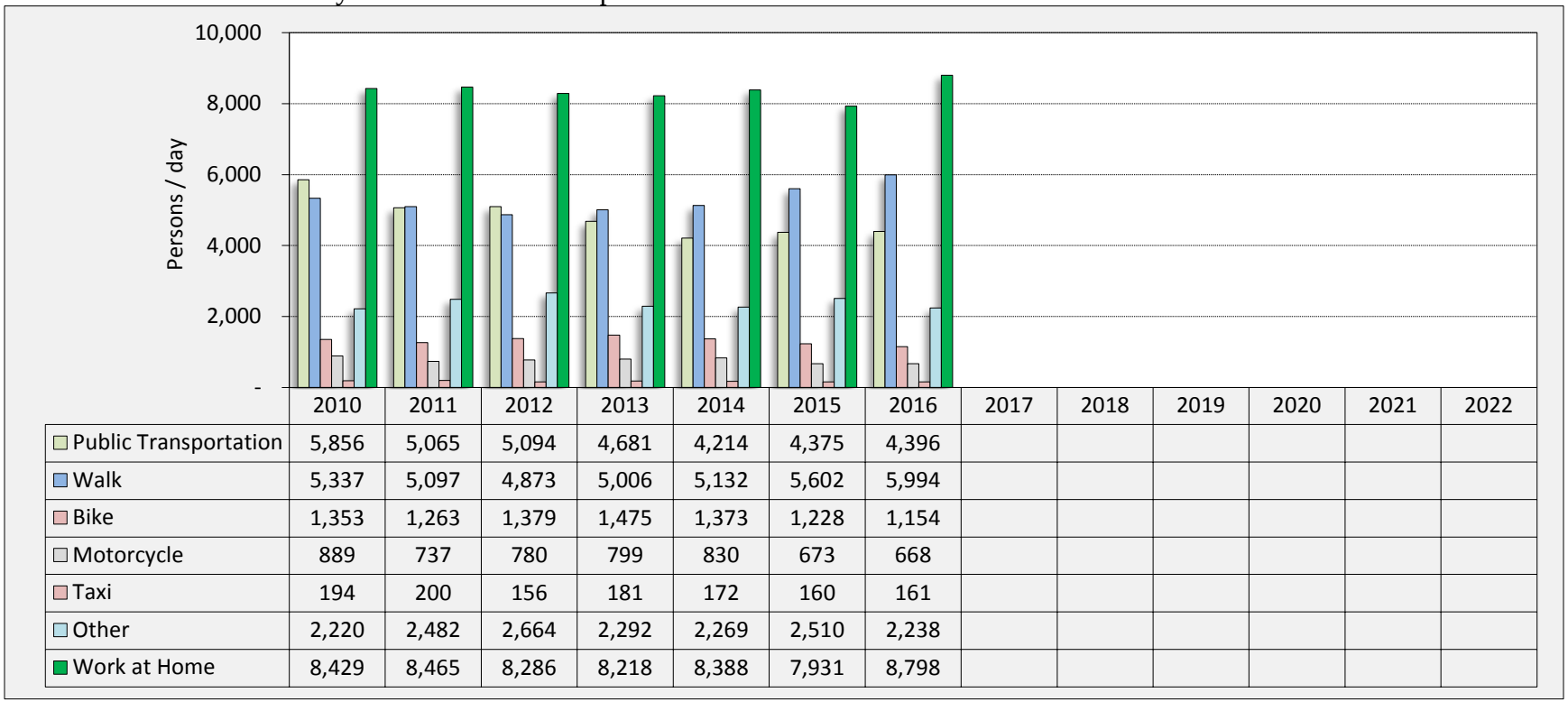
Improvement looks like:

- Drive Alone mode and Rate decreasing.
- Car/Van Pool mode increasing.

References:

1. U.S. Census Bureau, American Fact Finder, Report B08301 "MEANS OF TRANSPORTATION TO WORK Universe: Workers 16 years and over. (2010-2016) American Community Survey 1-Year Estimates" for Washoe County, Nevada (www.census.gov).

Figure B.4
Primary KPI: Means of Transportation to Work Other Than Drive Alone and Car/Van Pool



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Public Transportation	5,856	5,065	5,094	4,681	4,214	4,375	4,396						
Walk	5,337	5,097	4,873	5,006	5,132	5,602	5,994						
Bike	1,353	1,263	1,379	1,475	1,373	1,228	1,154						
Motorcycle	889	737	780	799	830	673	668						
Taxi	194	200	156	181	172	160	161						
Other	2,220	2,482	2,664	2,292	2,269	2,510	2,238						
Work at Home	8,429	8,465	8,286	8,218	8,388	7,931	8,798						

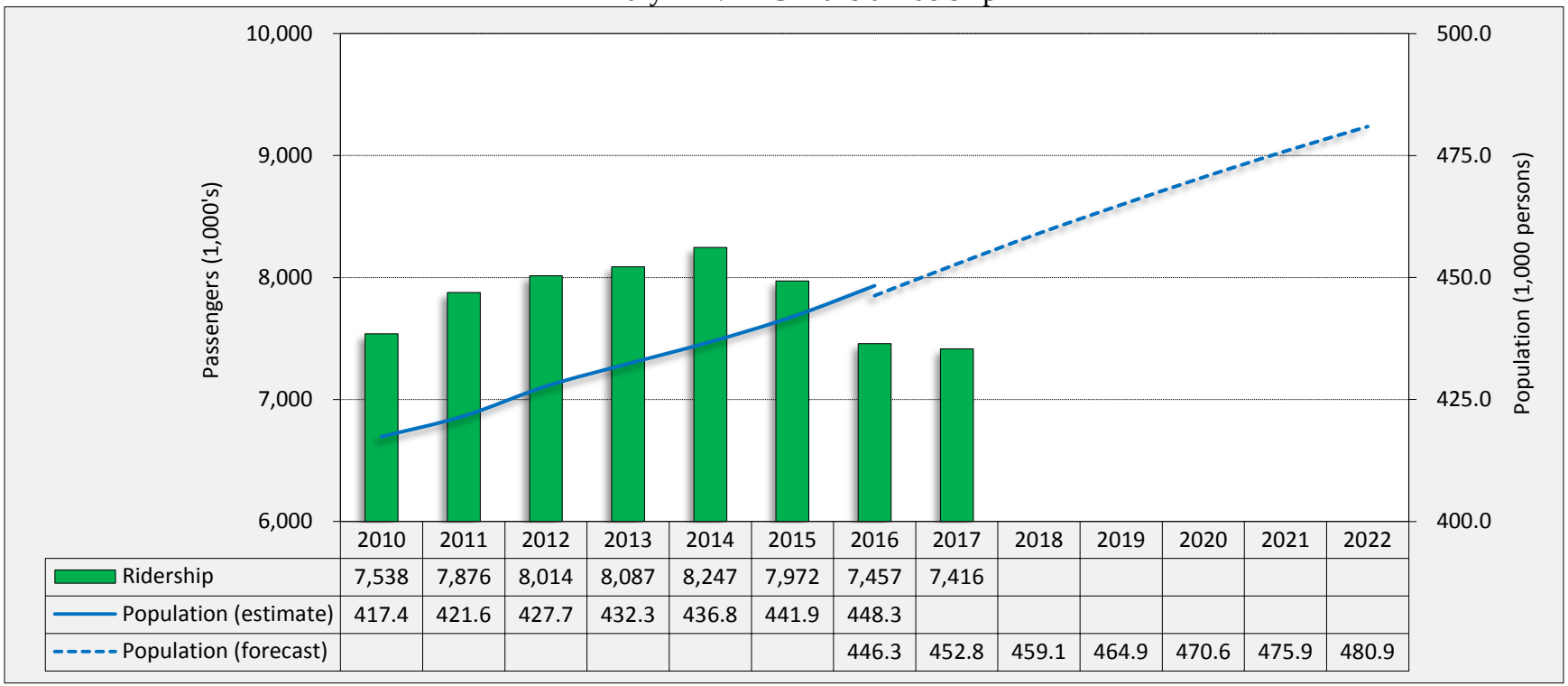
Improvement looks like:

- Public Transportation, Walk, Bike and Work at Home modes increasing.

References:

1. U.S. Census Bureau, American Fact Finder, Report B08301 "MEANS OF TRANSPORTATION TO WORK Universe: Workers 16 years and over. (2010-2016) American Community Survey 1-Year Estimates" for Washoe County, Nevada (www.census.gov).

Figure B.5
Primary KPI: RTC Transit Ridership



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Ridership	7,538	7,876	8,014	8,087	8,247	7,972	7,457	7,416					
Population (estimate)	417.4	421.6	427.7	432.3	436.8	441.9	448.3						
Population (forecast)							446.3	452.8	459.1	464.9	470.6	475.9	480.9

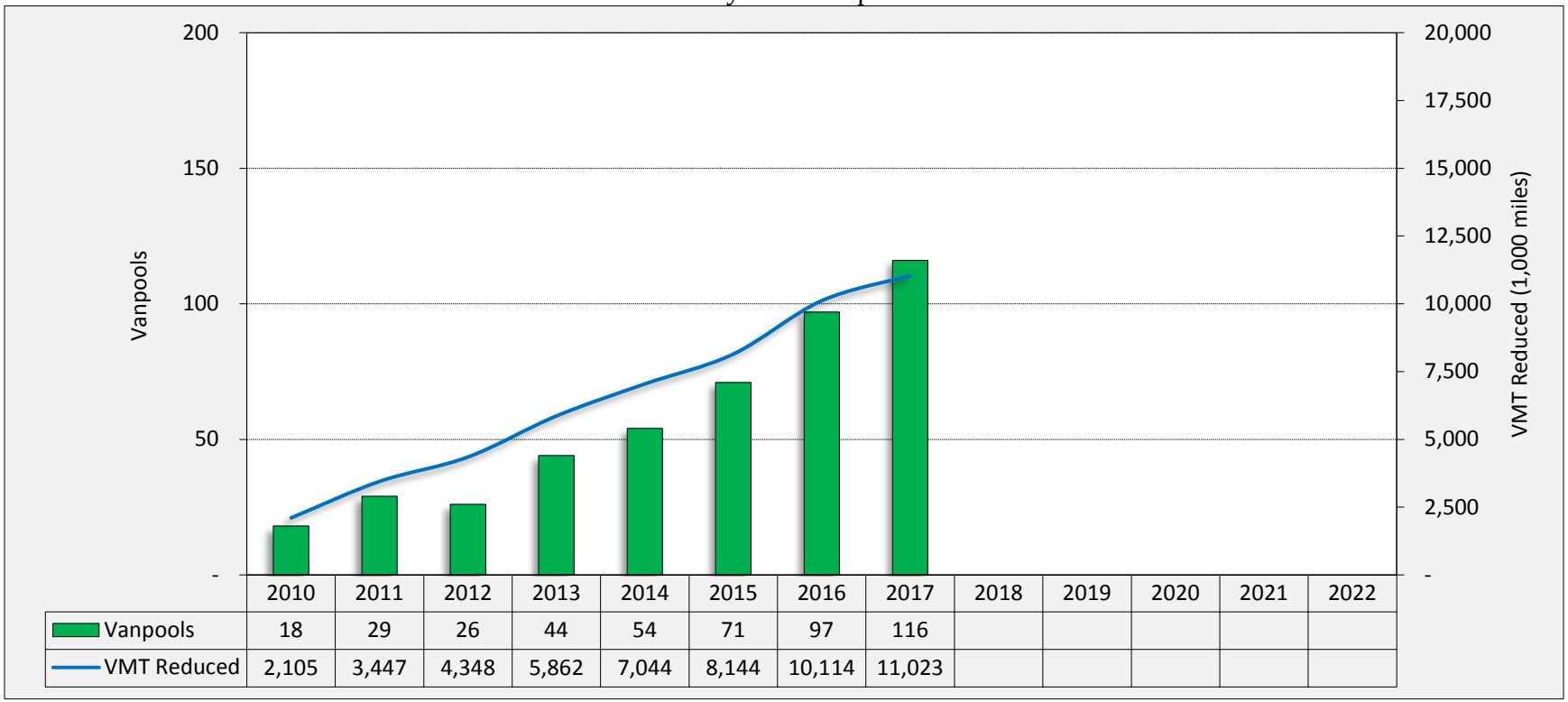
Improvement looks like:

- Transit ridership increasing

References:

1. RTC, Public Transportation and Operations Department. Requested.

Figure B.6
Primary KPI: Vanpools



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Vanpools	18	29	26	44	54	71	97	116					
VMT Reduced	2,105	3,447	4,348	5,862	7,044	8,144	10,114	11,023					

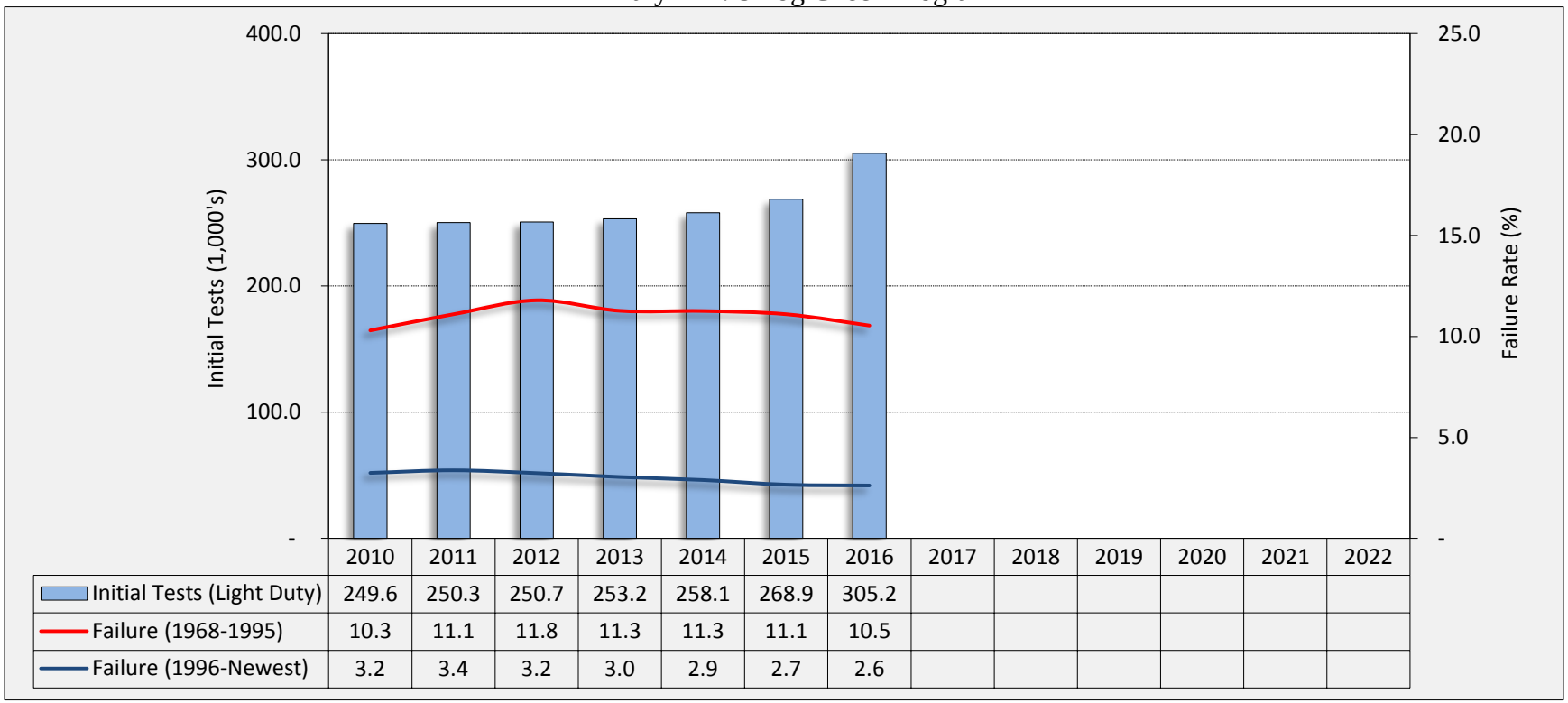
Improvement looks like:

- Number of vanpools increasing
- VMT reduced increasing

References:

1. RTC, Planning Department. Requested.

Figure B.7
Primary KPI: Smog Check Program



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Initial Tests (Light Duty)	249.6	250.3	250.7	253.2	258.1	268.9	305.2						
Failure (1968-1995)	10.3	11.1	11.8	11.3	11.3	11.1	10.5						
Failure (1996-Newest)	3.2	3.4	3.2	3.0	2.9	2.7	2.6						

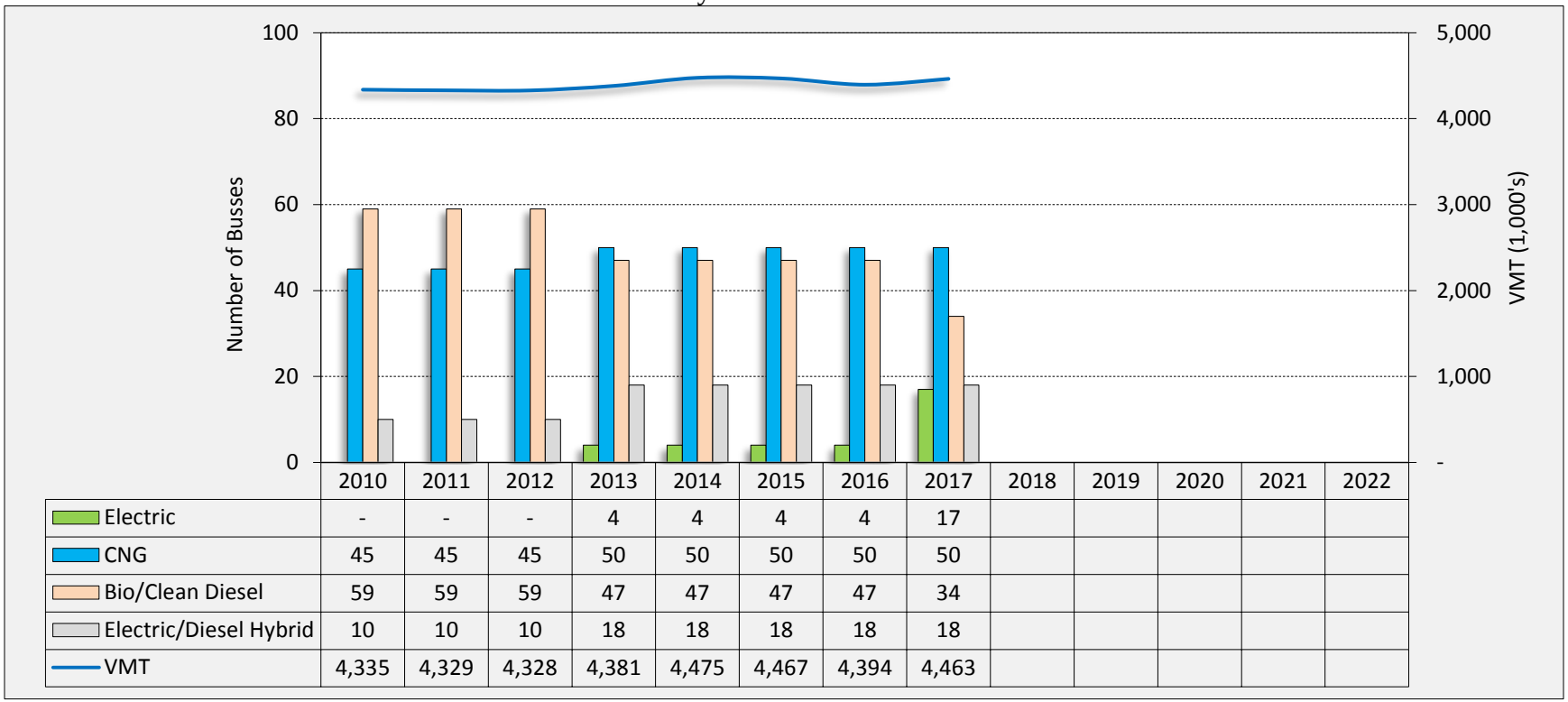
Improvement looks like:

- Initial test failure rates decreasing.

References:

1. Nevada Department of Motor Vehicles, Compliance Enforcement Division, "[2010-2016] Activity Report, Motor Vehicle Inspection and Maintenance Program". Also available at http://nevadadmv.state.nv.us/emission.htm.

Figure B.8
Primary KPI: Transit Busses



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Electric	-	-	-	4	4	4	4	17					
CNG	45	45	45	50	50	50	50	50					
Bio/Clean Diesel	59	59	59	47	47	47	47	34					
Electric/Diesel Hybrid	10	10	10	18	18	18	18	18					
VMT	4,335	4,329	4,328	4,381	4,475	4,467	4,394	4,463					

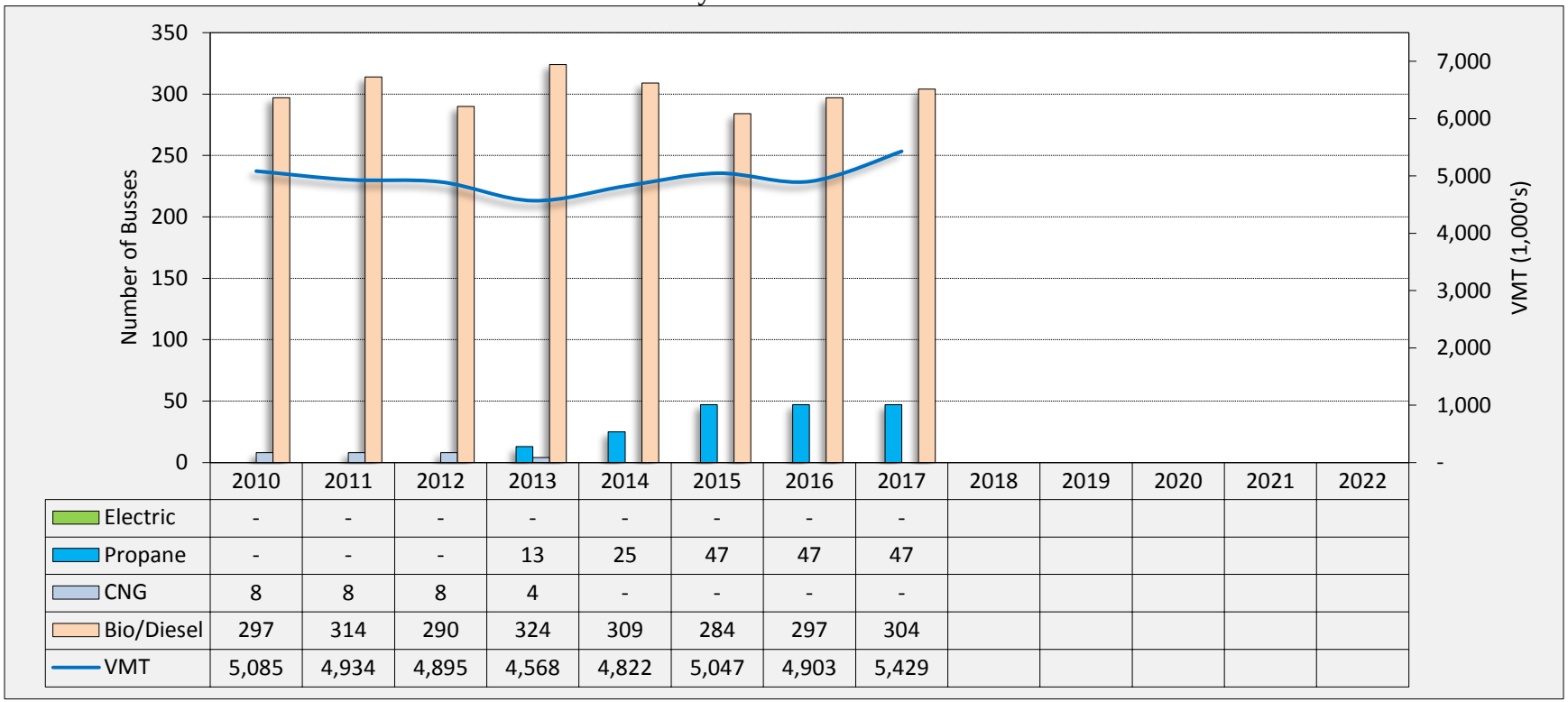
Improvement looks like:

- Number of diesel busses decreasing
- Number of electric busses increasing
- Number of CNG, propane, and bio/renewable diesel busses increasing
- Bus VMT increasing

References:

1. RTC, Public Transportation and Operations Department. Requested.

Figure B.9
Primary KPI: School Busses



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Electric	-	-	-	-	-	-	-	-					
Propane	-	-	-	13	25	47	47	47					
CNG	8	8	8	4	-	-	-	-					
Bio/Diesel	297	314	290	324	309	284	297	304					
VMT	5,085	4,934	4,895	4,568	4,822	5,047	4,903	5,429					

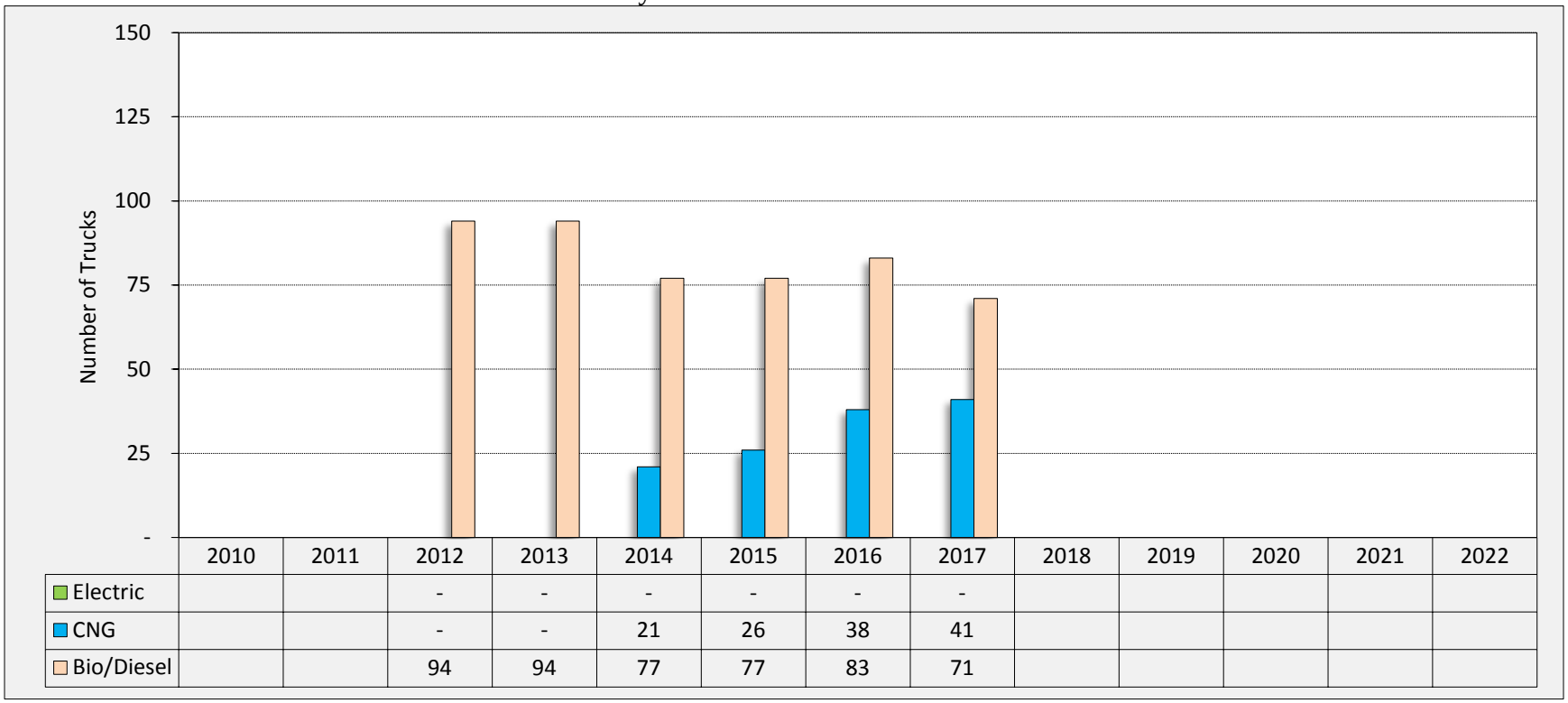
Improvement looks like:

- Number and percentage of diesel busses decreasing
- Number and percentage of electric and propane busses increasing

References:

1. Washoe County School District, Transportation Department. Requested.

Figure B.10
Primary KPI: Waste Collection Trucks



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Electric			-	-	-	-	-	-					
CNG			-	-	21	26	38	41					
Bio/Diesel			94	94	77	77	83	71					

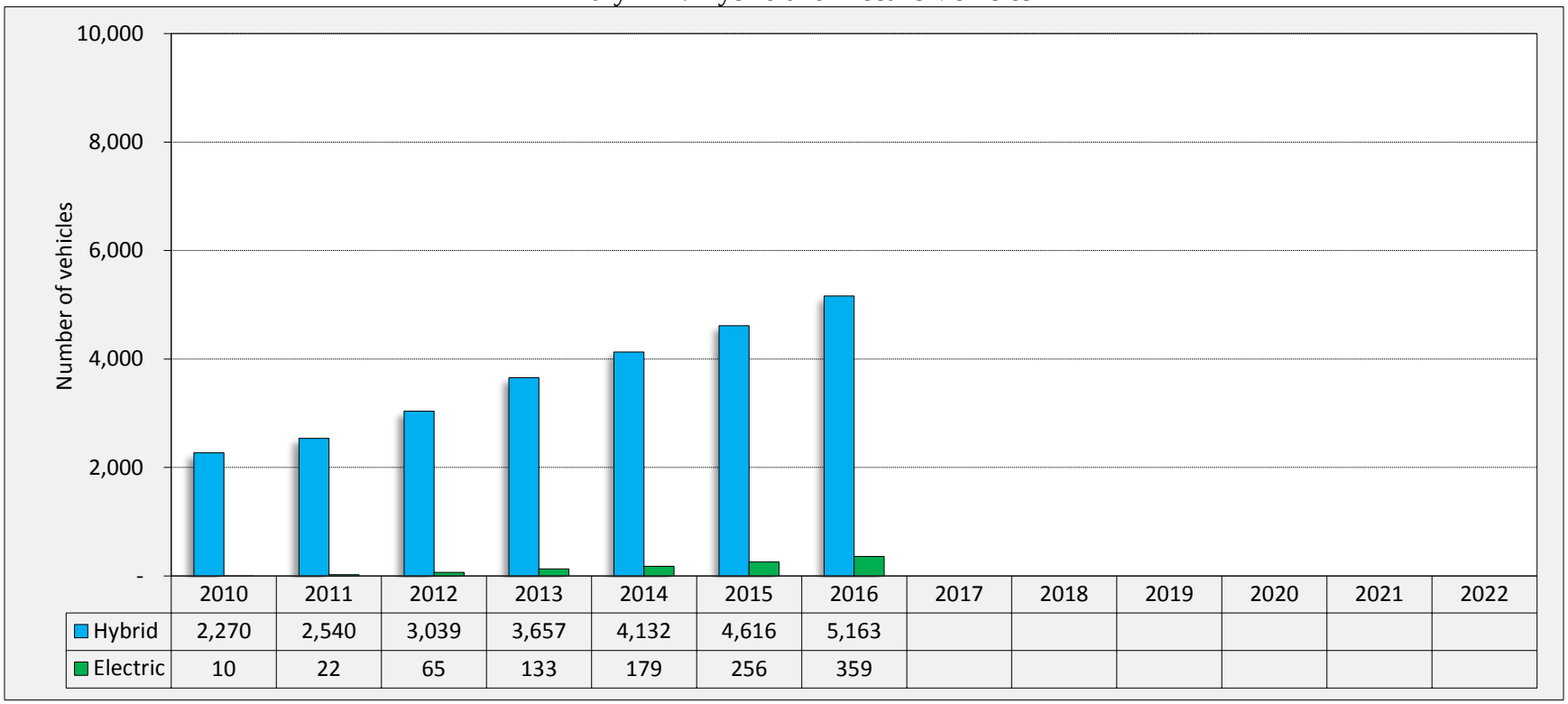
Improvement looks like:

- Number of diesel trucks decreasing
- Number of CNG and electric trucks increasing

References:

1. Waste Management. Requested.

Figure B.11
Primary KPI: Hybrid and Electric Vehicles



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Hybrid	2,270	2,540	3,039	3,657	4,132	4,616	5,163						
Electric	10	22	65	133	179	256	359						

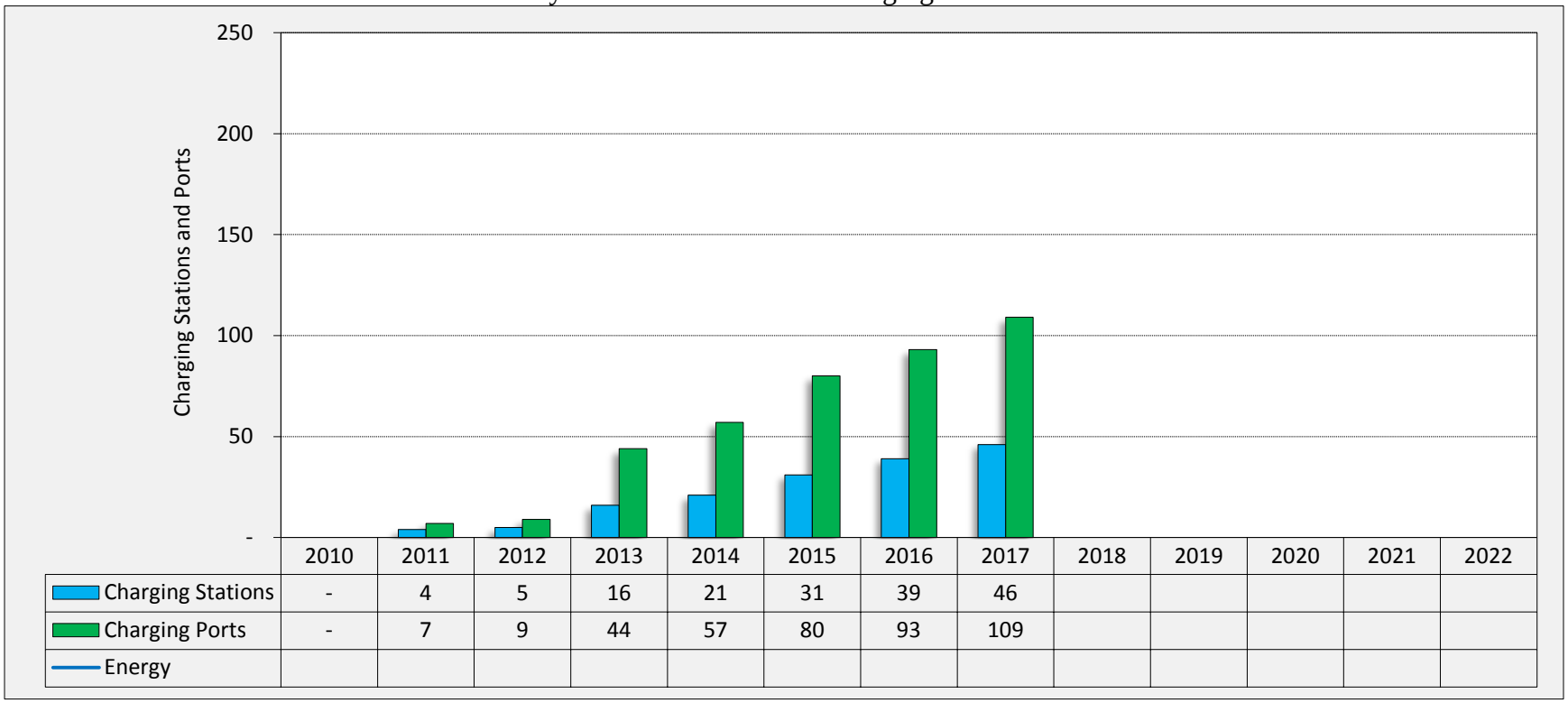
Improvement looks like:

- Number of hybrid and electric vehicles increasing.

References:

1. State of Nevada, Governor's Office of Energy. Requested.

Figure B.12
Primary KPI: Electric Vehicle Charging Infrastructure



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Charging Stations	-	4	5	16	21	31	39	46					
Charging Ports	-	7	9	44	57	80	93	109					
Energy													

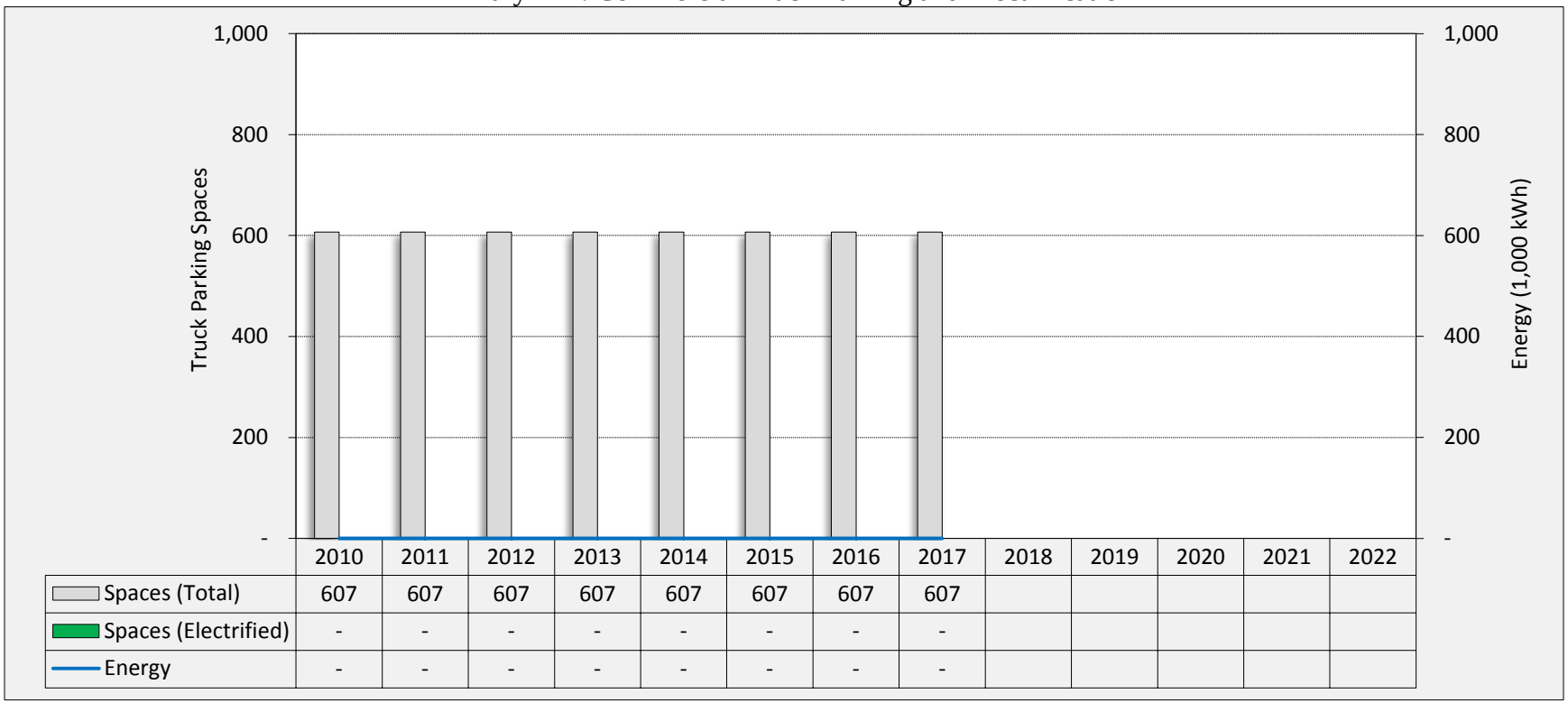
Improvement looks like:

- Number of charging stations and ports increasing
- Energy increasing

References:

1. Charging Stations and Ports: State of Nevada, Governor's Office of Energy. Requested.
2. Energy: Not available.

Figure B.13
Primary KPI: Commercial Truck Parking and Electrification



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Spaces (Total)	607	607	607	607	607	607	607	607					
Spaces (Electrified)	-	-	-	-	-	-	-	-					
Energy	-	-	-	-	-	-	-	-					

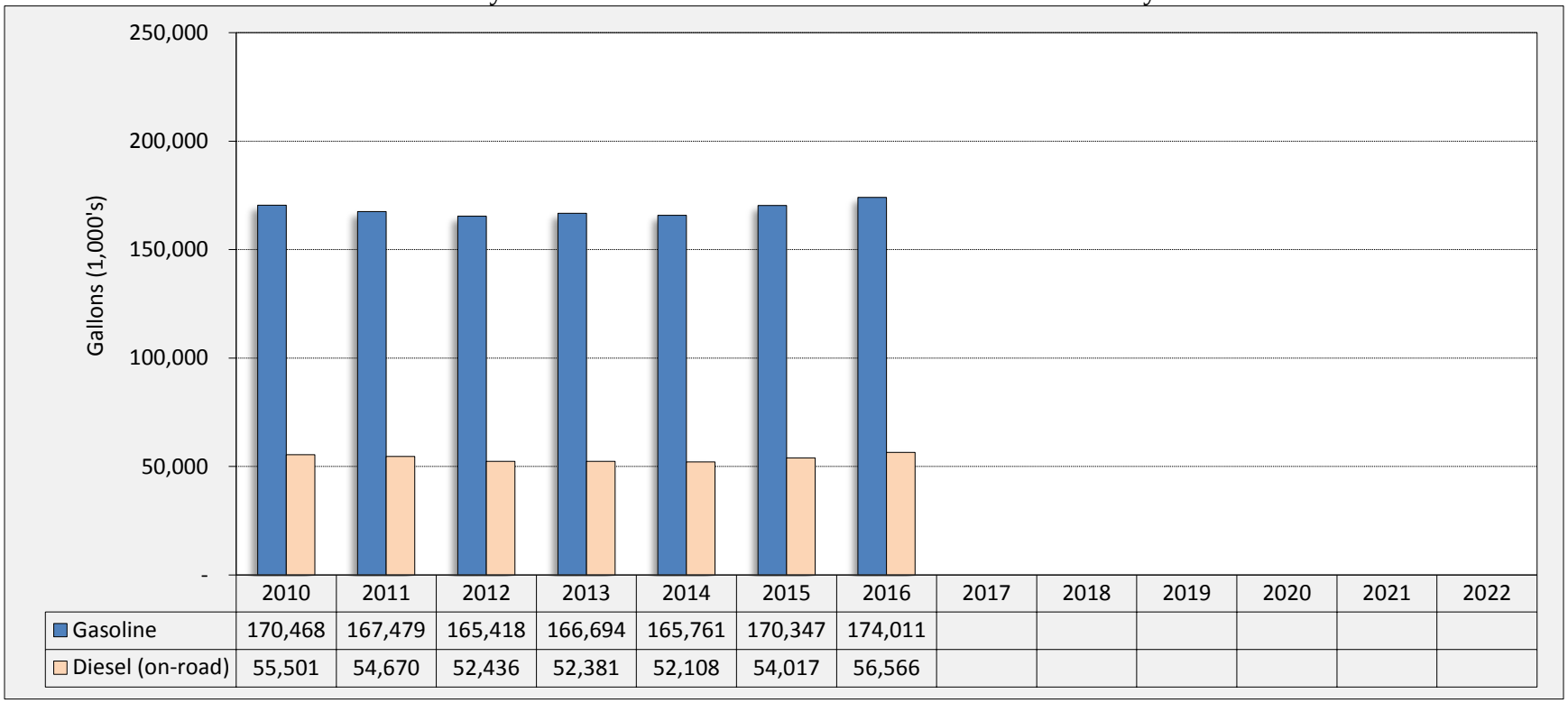
Improvement looks like:

- Percentage of electrified truck parking spaces increasing.
- Energy increasing.

References:

1. Spaces (Total): Nevada Department of Transportation, Freight Planning Section. (www.nevadadot.com/mobility/freight-planning/truck-parking)
2. Spaces (Electrified): U.S. Department of Energy, Alternative Fuels Data Center. (www.afdc.energy.gov/tse_locator/)

Figure B.14
Primary KPI: Gasoline and Clear Diesel Sold in Washoe County



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Gasoline	170,468	167,479	165,418	166,694	165,761	170,347	174,011						
Diesel (on-road)	55,501	54,670	52,436	52,381	52,108	54,017	56,566						

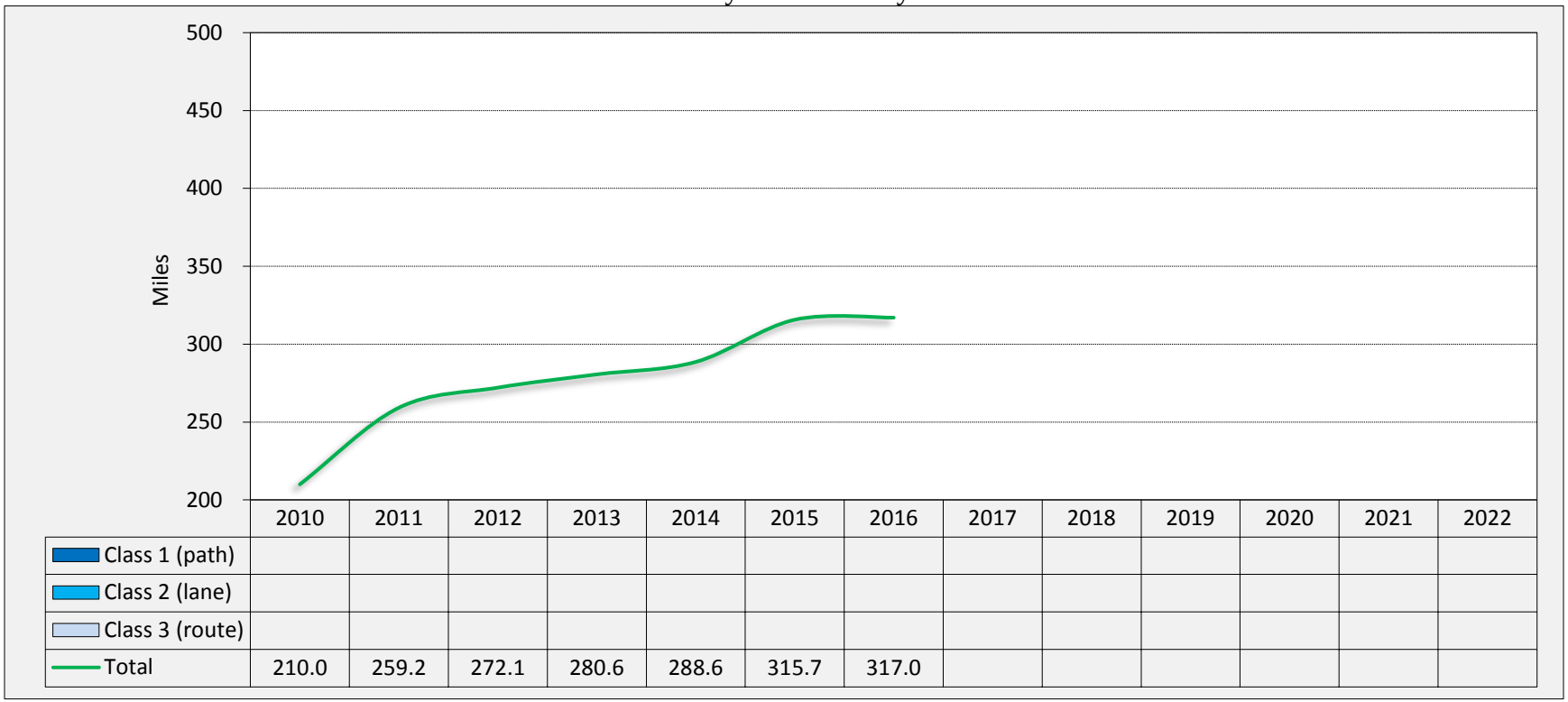
Improvement looks like:

- Gasoline and diesel throughputs decreasing, or increasing at a slower rate

References:

1. Nevada Department of Motor Vehicles, Motor Carrier Division. Requested.

Figure B.15
Primary KPI: Bikeways



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Class 1 (path)													
Class 2 (lane)													
Class 3 (route)													
Total	210.0	259.2	272.1	280.6	288.6	315.7	317.0						

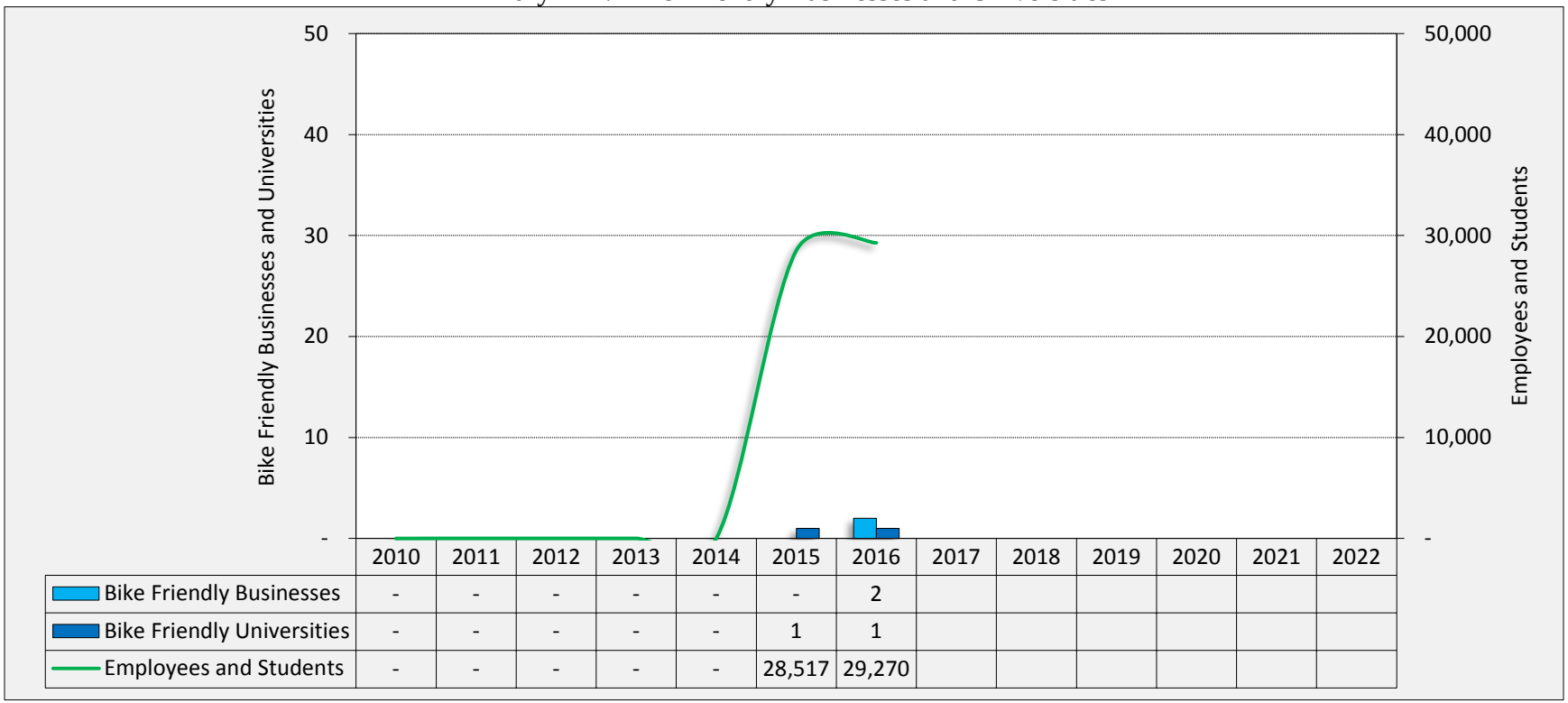
Improvement looks like:

- Miles of bikeways increasing.

References:

1. Regional Transportation Commission of Washoe County, Planning Department. Requested.

Figure B.16
Primary KPI: Bike Friendly Businesses and Universities



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bike Friendly Businesses	-	-	-	-	-	-	2						
Bike Friendly Universities	-	-	-	-	-	1	1						
Employees and Students	-	-	-	-	-	28,517	29,270						

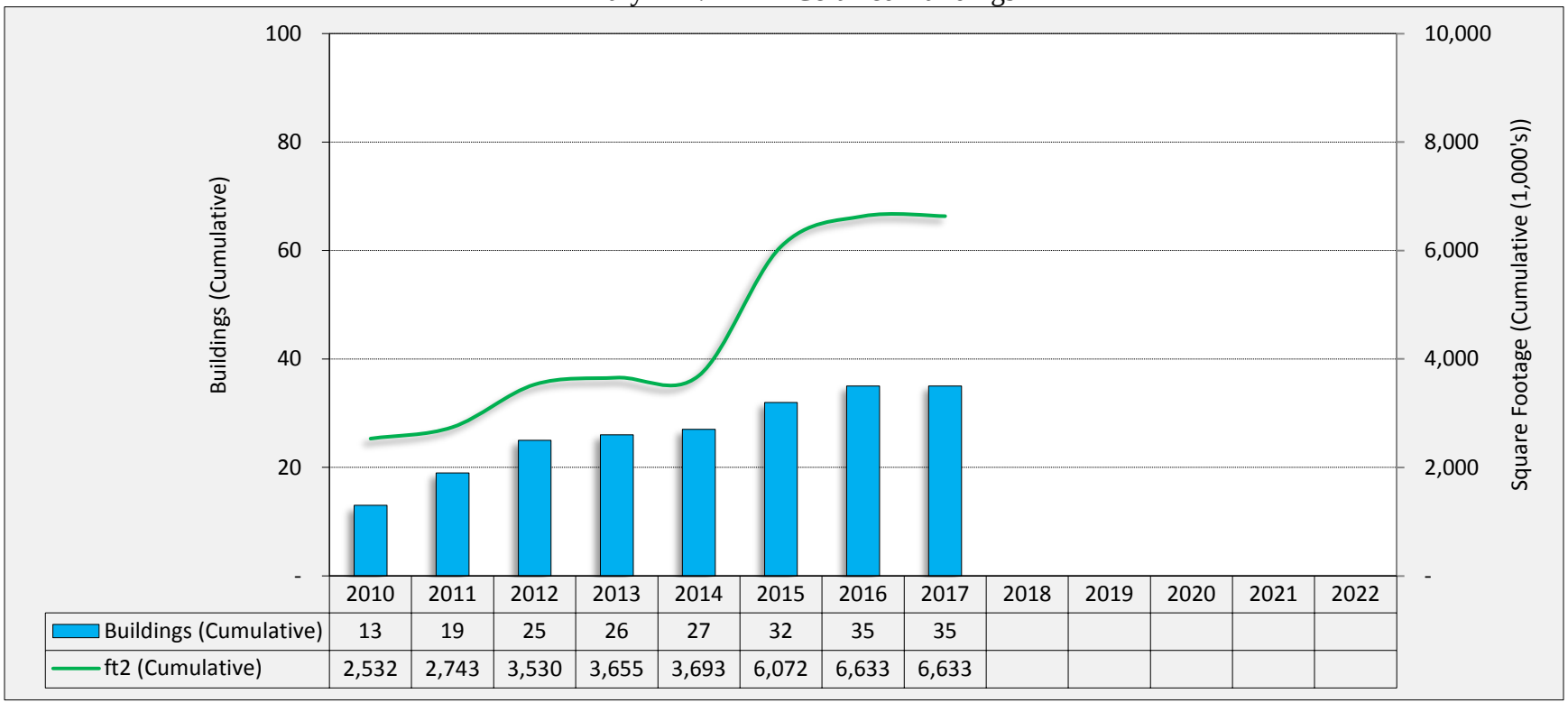
Improvement looks like:

- Number of Bike Friendly Businesses (BFB) and Universities (BFU) increasing.
- Number of employees and students at BFB and BFU increasing.

References:

1. The League of American Bicyclists, Bicycle Friendly America, Award Database (http://bikeleague.org/bfa/awards).

Figure B.17
Primary KPI: LEED Certified Buildings



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Buildings (Cumulative)	13	19	25	26	27	32	35	35					
ft2 (Cumulative)	2,532	2,743	3,530	3,655	3,693	6,072	6,633	6,633					

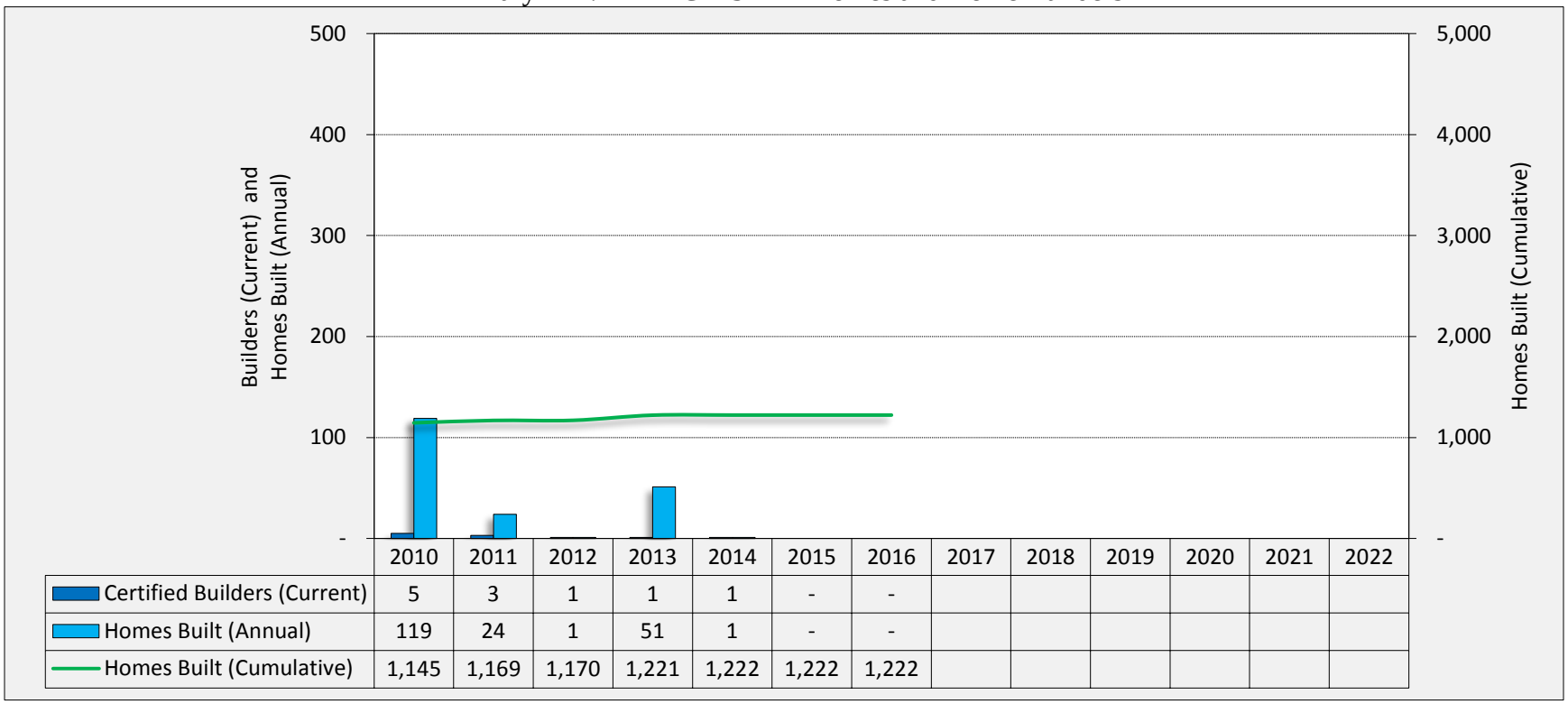
Improvement looks like:

- Number of certified LEED buildings and square footage increasing.

References:

1. City of Reno. Requested.

Figure B.18
Primary KPI: ENERGY STAR Homes and Home Builders



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Certified Builders (Current)	5	3	1	1	1	-	-						
Homes Built (Annual)	119	24	1	51	1	-	-						
Homes Built (Cumulative)	1,145	1,169	1,170	1,221	1,222	1,222	1,222						

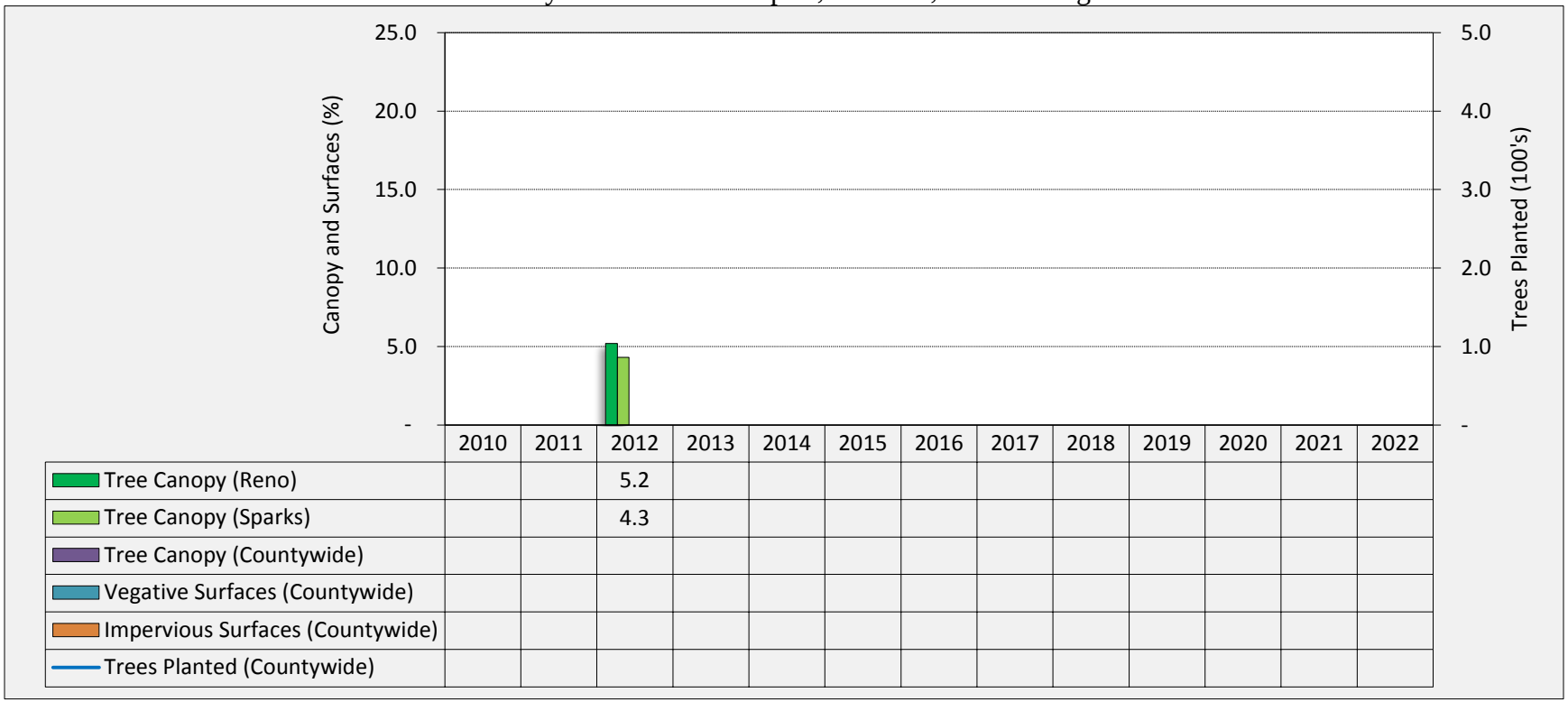
Improvement looks like:

- Number of certified ENERGY STAR builders and homes built increasing.

References:

2. ENERGY STAR (energystar.gov). Requested.
3. Market Share: ENERGY STAR (www.energystar.gov/newhomes/2016_energy_star_certified_new_homes_market_share)

Figure B.19
Primary KPI 2: Tree Canopies, Surfaces, and Plantings



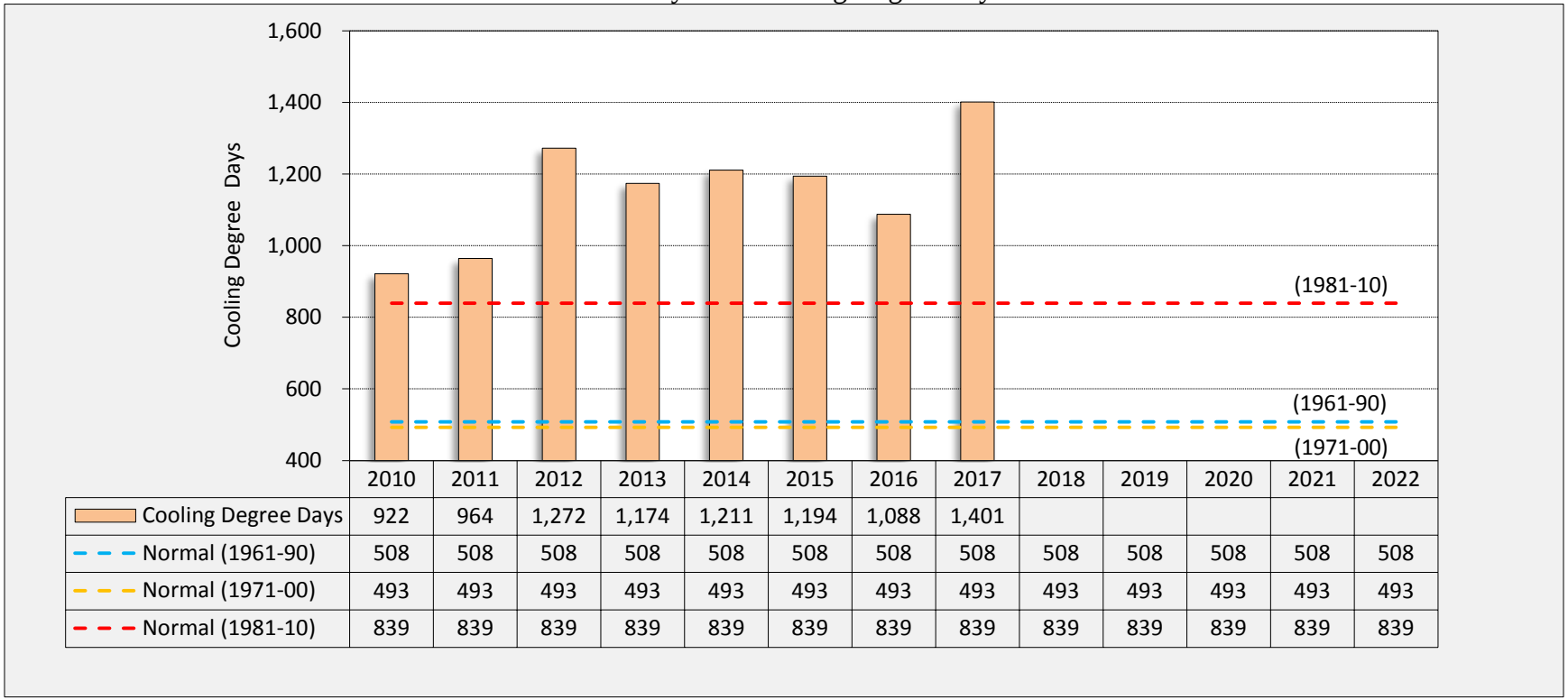
Improvement looks like:

- Tree Canopy, Vegetative Surfaces, and Trees Planted increasing.
- Impervious Surfaces decreasing

References:

1. City of Reno "Urban Forestry Management Plan", adopted May 25, 2016.

Figure B.20
Secondary KPI: Cooling Degree Days



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Cooling Degree Days	922	964	1,272	1,174	1,211	1,194	1,088	1,401					
Normal (1961-90)	508	508	508	508	508	508	508	508	508	508	508	508	508
Normal (1971-00)	493	493	493	493	493	493	493	493	493	493	493	493	493
Normal (1981-10)	839	839	839	839	839	839	839	839	839	839	839	839	839

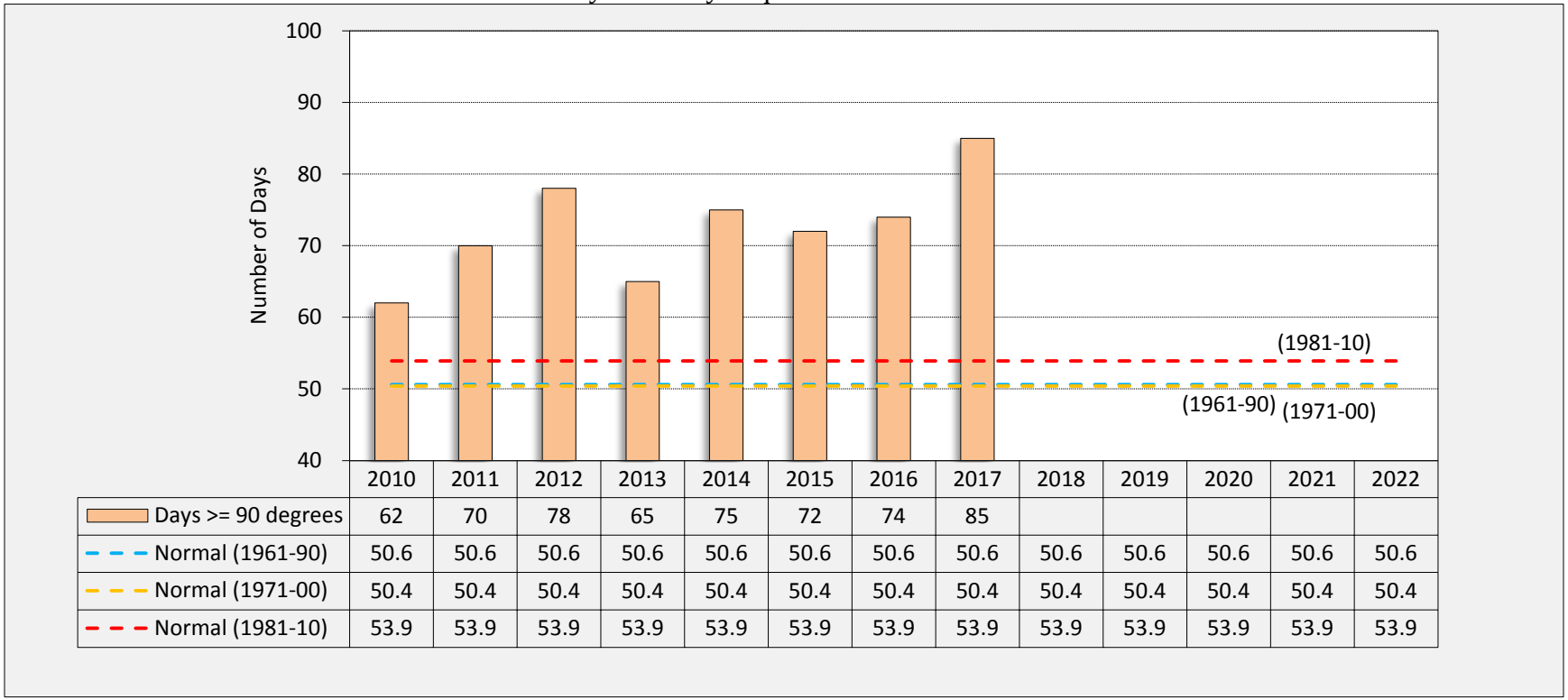
Improvement looks like:

- Number of cooling degree days decreasing

References:

1. National Oceanic and Atmospheric Association, National Centers for Environmental Information (www.ncdc.noaa.gov/IPS/lcd/lcd.html?_page=1&state=NV&stationID=23185&_target2=Next+%253E)
2. 2017 Preliminary Data: National Weather Service Forecast Office - Reno, NV (http://w2.weather.gov/climate/index.php?wfo=rev)

Figure B.21
Secondary KPI: Days Equal To or Greater Than 90^{O}



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Days >= 90 degrees	62	70	78	65	75	72	74	85					
Normal (1961-90)	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6	50.6
Normal (1971-00)	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4	50.4
Normal (1981-10)	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9

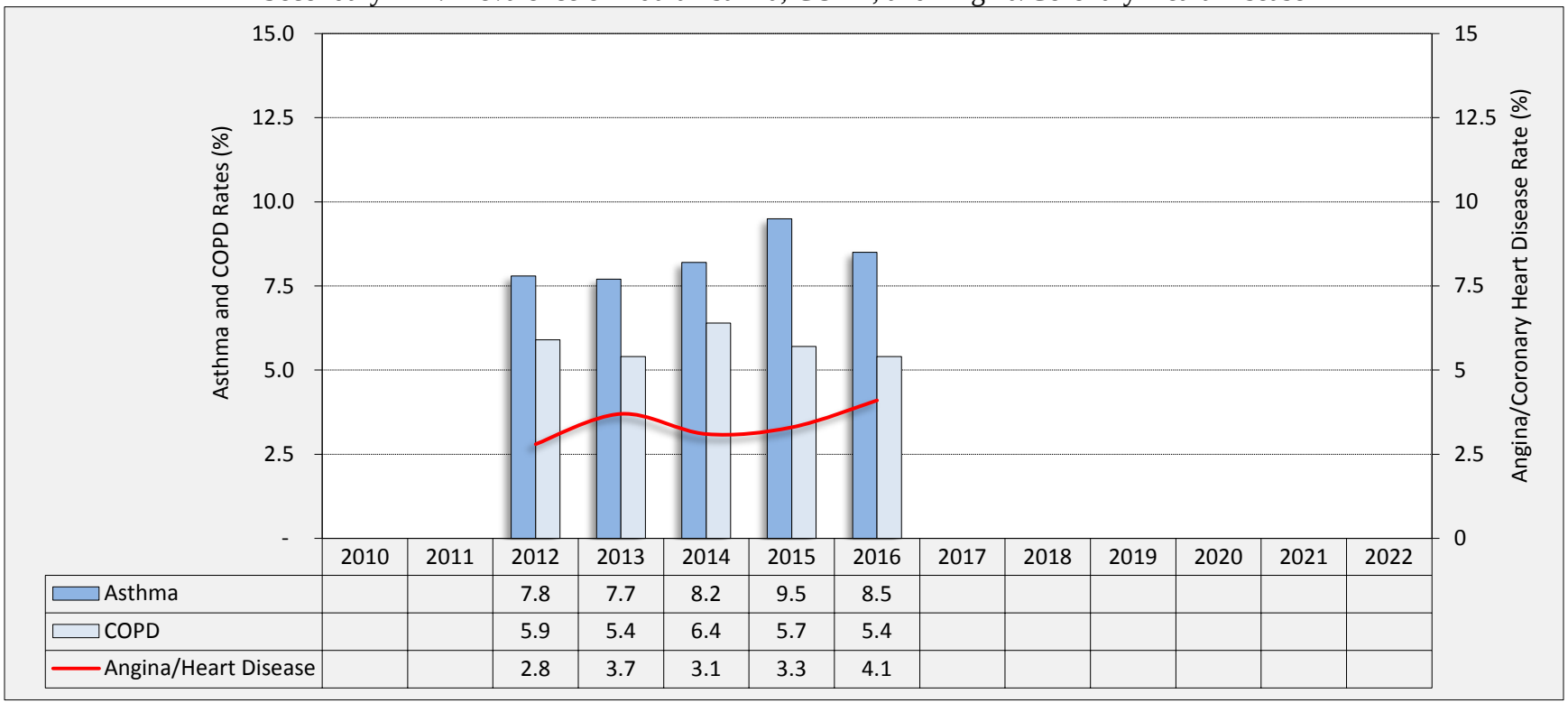
Improvement looks like:

- Number of days equal to or greater than 90 degrees decreasing

References:

1. National Oceanic and Atmospheric Association, National Centers for Environmental Information (www.ncdc.noaa.gov/IPS/lcd/lcd.html?_page=1&state=NV&stationID=23185&_target2=Next+%253E)
2. 2017 Preliminary Data: National Weather Service Forecast Office - Reno, NV (http://w2.weather.gov/climate/index.php?wfo=rev)

Figure B.22
Secondary KPI: Prevalence of Adult Asthma, COPD, and Angina/Coronary Heart Disease



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Asthma			7.8	7.7	8.2	9.5	8.5						
COPD			5.9	5.4	6.4	5.7	5.4						
Angina/Heart Disease			2.8	3.7	3.1	3.3	4.1						

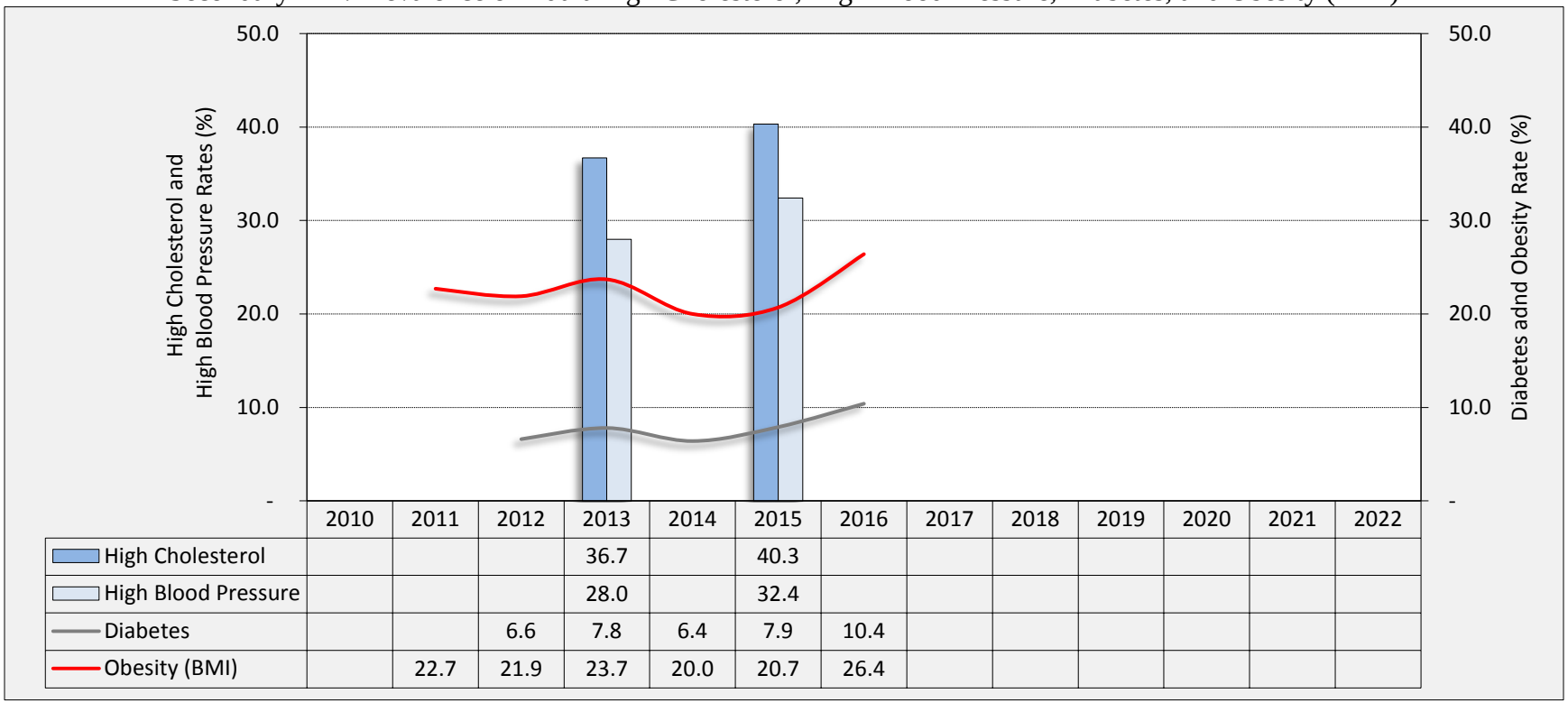
Improvement looks like:

- Adult Asthma, COPD, and Angina/Coronary Heart Disease rates decreasing.

References:

1. "2018-2020 Washoe County Community Needs Assessment", Section 1.16 (Chronic Diseases), January 2018. Available from the Washoe County Health District (www.washoecounty.us/health/index.php).

Figure B.23
Secondary KPI: Prevalence of Adult High Cholesterol, High Blood Pressure, Diabetes, and Obesity (BMI)



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
High Cholesterol				36.7		40.3							
High Blood Pressure				28.0		32.4							
Diabetes			6.6	7.8	6.4	7.9	10.4						
Obesity (BMI)		22.7	21.9	23.7	20.0	20.7	26.4						

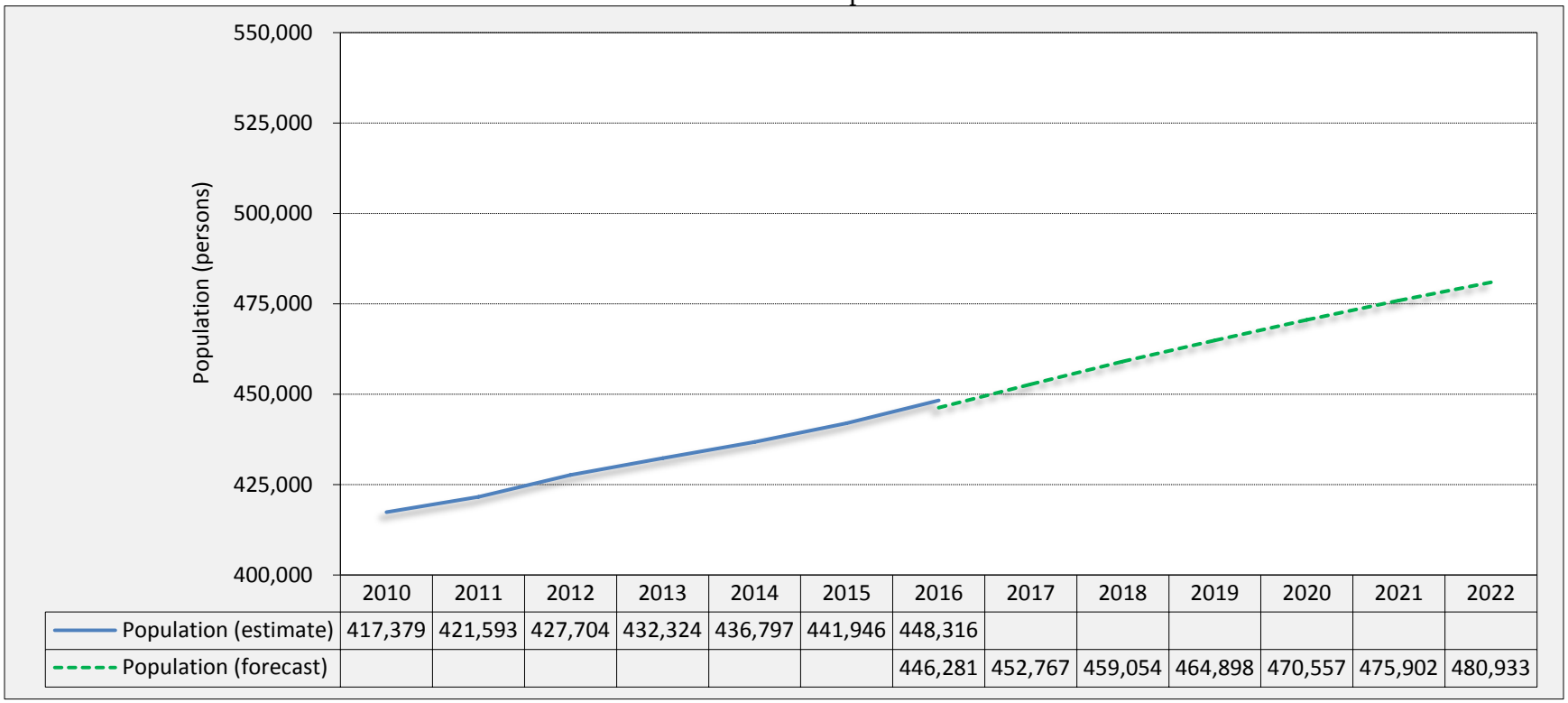
Improvement looks like:

- Adult High Cholesterol, High Blood Pressure, Diabetes, and Obesity (BMI) rates decreasing.

References:

1. Cholesterol, Blood Pressure, and Diabetes: "2018-2020 Washoe County Community Needs Assessment", Section 1.16 (Chronic Diseases), January 2018. Available from the Washoe County Health District (www.washoecounty.us/health/index.php).
2. Obesity (BMI): Centers for Disease Control and Prevention. BRFSS Prevalence and Trends Data query tool, "Reno, NV Metropolitan Statistical Area" (www.cdc.gov/brfss/brfssprevalence/index.html).

Figure B.24
Associated KPI: Population

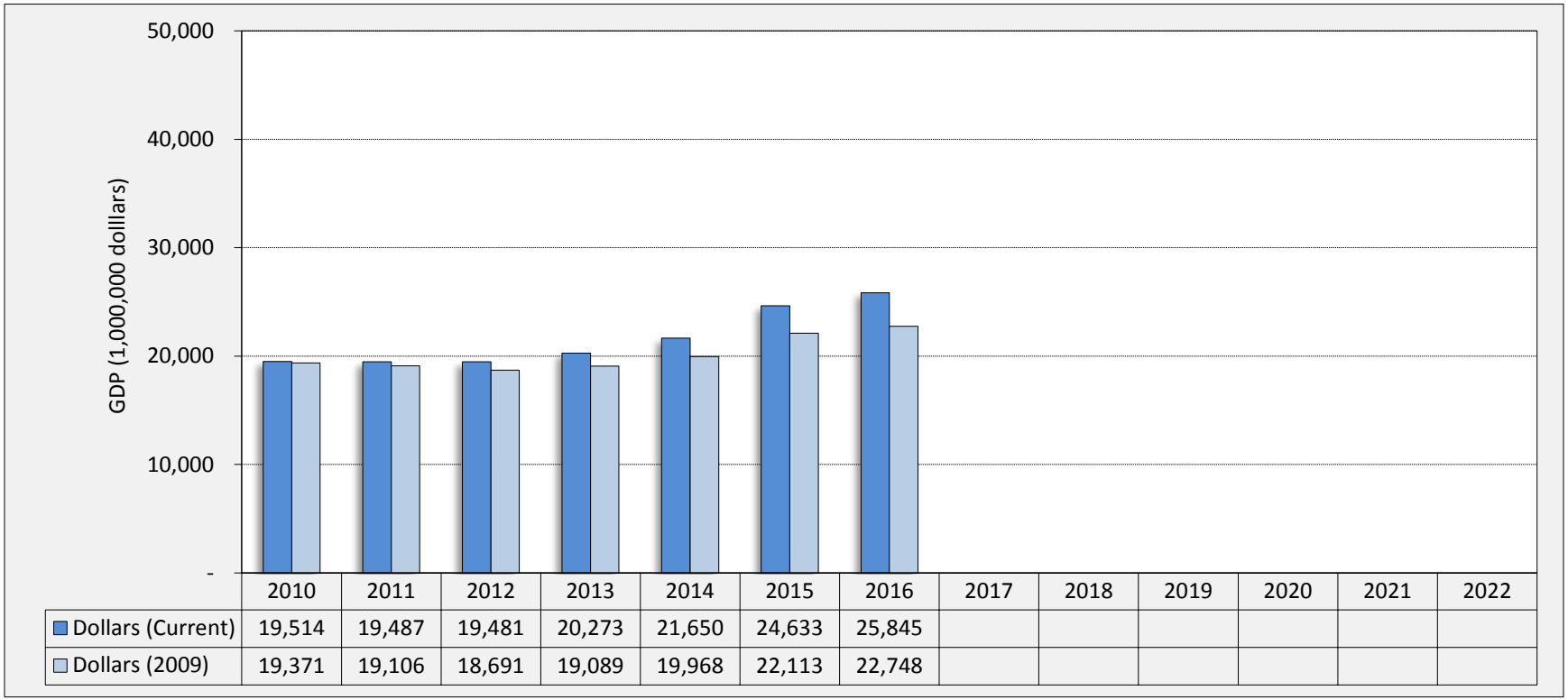


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Population (estimate)	417,379	421,593	427,704	432,324	436,797	441,946	448,316						
Population (forecast)							446,281	452,767	459,054	464,898	470,557	475,902	480,933

References:

1. Population (estimate): Governor Certified Population Estimates of Nevada's Counties, Cities and Towns 2000 to 2016. (https://tax.nv.gov/Publications/Population_Statistics_and_Reports/)
2. Population (forecast): Washoe County Consensus Forecast 2016 - 2036, September 2016. (www.tmrpa.org//files/reports/16-09-28%20WC%20Consensus%20Forecast%202016%20Final%20with%20Appendices.pdf)

Figure B.25
Associated KPI: Gross Domestic Product



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Dollars (Current)	19,514	19,487	19,481	20,273	21,650	24,633	25,845						
Dollars (2009)	19,371	19,106	18,691	19,089	19,968	22,113	22,748						

Improvement looks like:

- GDP increasing.

References:

1. U.S. Department of Commerce; Bureau of Economic Analysis (www.bea.gov), Reno, NV Metropolitan Statistical Area.