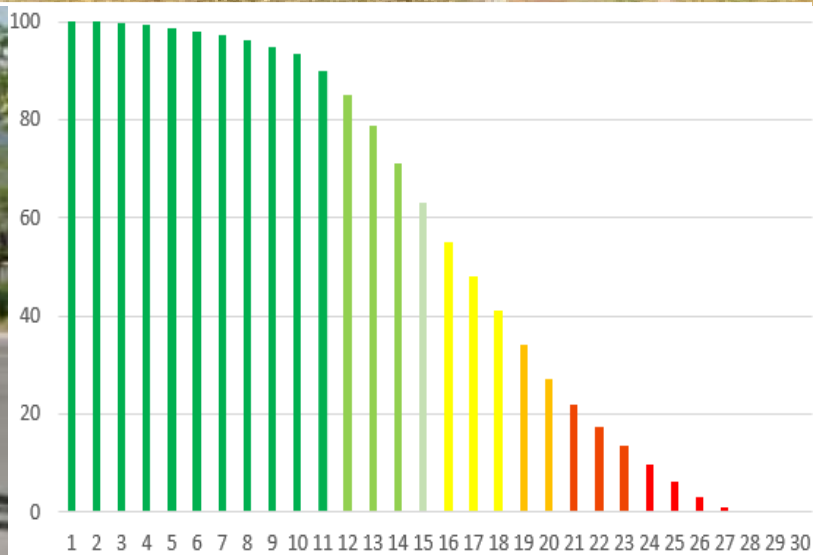


# WASHOE COUNTY REGIONAL PARKS AND OPEN SPACE

Pavement Condition, Risk, and Renovation Prioritization Program



COMMUNITY  
SERVICES DEPARTMENT

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## BACKGROUND

Washoe County Regional Parks and Open Space mission is to provide exceptional parks and open space and recreational opportunities while preserving our natural, historical and cultural resources. Parks and open space significantly benefit our communities' physical, mental, and economic health. Parks decrease rates of depression, increase property values, attract tourists, provide sustainable ecosystems, and help to mitigate flooding. Quality of life overall is improved by access to safe, open, and clean parks. This has been especially true during the COVID-19 pandemic, when park attendance reached an all-time high as people sought a respite from the indoors. The pandemic also came at a time when staff were still battling the impacts of the 2007-2017 budget cuts. Because of this, infrastructure preservation has been largely a reactive endeavor. In the next 25 years many roads and parking lots are expected to reach the end of their useful life and will need to be replaced, renovated, or removed so they do not become a safety hazard. In 2016, Washoe County Regional Parks and Open Space (Parks) identified Park Infrastructure Preservation and Asset Protection as an integral part to Parks' mission. In 2018 Parks launched their Asset Management Program, whose goal is to minimize the total cost of ownership while delivering the level of service citizens desired. This Pavement Condition and Renovation Prioritization Program Report outlines the steps currently being taken to support that goal.

Parks maintains a variety of asset classes, which include pathways, parking lots, ornamental trees, buildings, trails, turf, foot bridges, aquatics facilities, native vegetation, and amenities. This report focuses on asphalt pavement, which are the outdoor fixed assets listed in table 1, and does not yet include playgrounds, pools, parking lots, irrigation, turf, pathways, and fencing. As the Asset Management Program grows and matures, other asset classes will be reported on as well.

## EXECUTIVE SUMMARY

Asphalt roads and parking lots provides significant value to Park customers. The importance of a hard and level parking lot is often overlooked when in good condition but when they fall into disrepair, they are not only a nuisance but also a safety risk. Pavement provides customers with convenience access to Parks and are a representation of how customers should treat and fund the parks. This report outlines the data driven approach Parks is using to prioritize limited resources in order to create the most value.

### Quick Facts about Washoe County Park Pavement

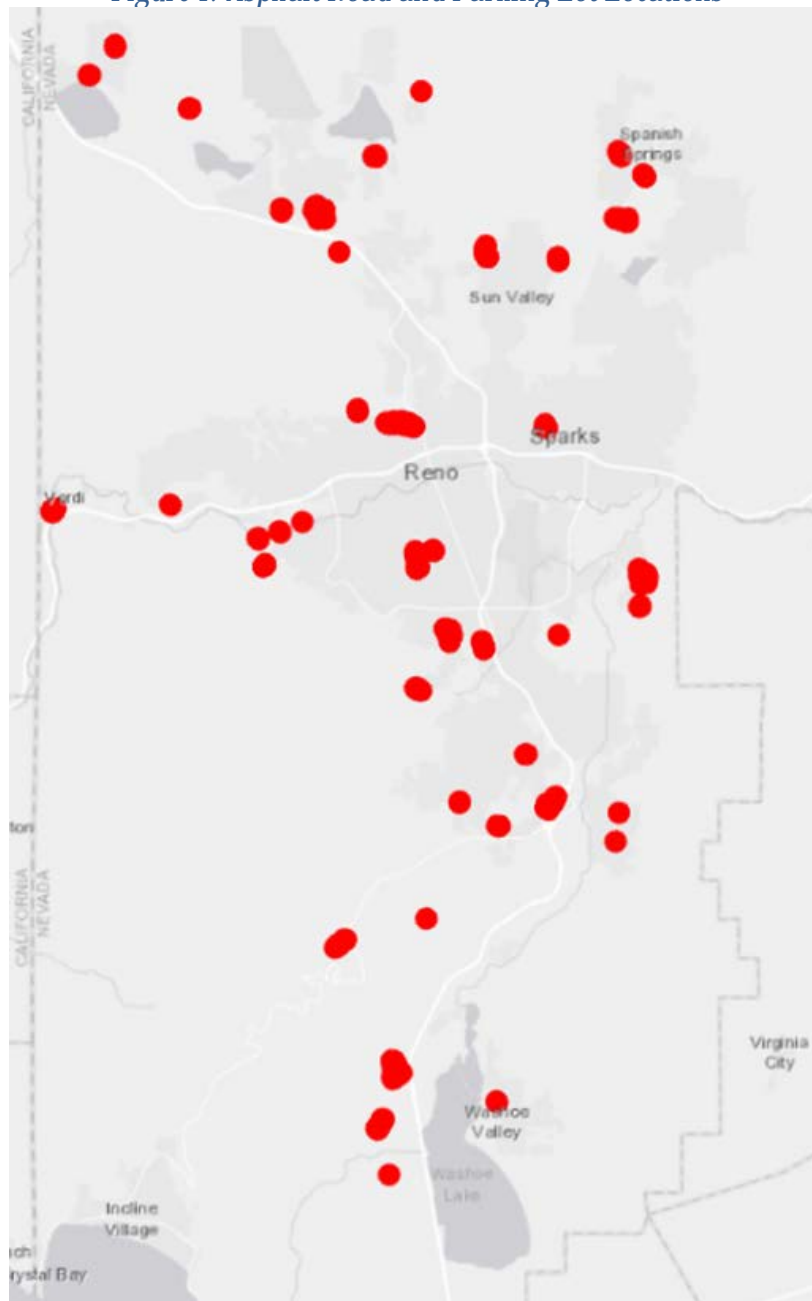
- **2,813,669** Total Square Feet of Pavement, roughly **65** acres
- **\$25,323,019** Total Estimated Amenity Value
- **26%** Percent of Park Assets By Value
- **Satisfactory** Average Condition
- **\$4,525,708** Current Labor and Material Capital Needs
- **\$243,638** Current High-Risk Repair Needs
- **\$778,614** Projected Annually Capital Needs to keep Pavement Satisfactory
- **12.4%** Average Annual Park Attendance Increase
- **20%** Park Attendance Increase Due to COVID-19

## INVENTORY

Individual paved roads and parking lot data has been compiled over time, through a variety of methods. Some roads and parking lots being measured and recorded in the field, while other data has been recorded using a combination of aerial photography and GIS technology. Updating the inventory is ongoing, but the most recent full scale update was completed during the summer of 2020 and coincided with the Pavement Protection Program's condition assessment. It is important to note that the park roads and parking lot inventory represents a snapshot in time and that park development, park upgrades, and data refinement efforts will influence inventory over time.

Currently there is **2,813,669 square feet** of Road and Parking Lot Pavement, including about **3,750 parking spaces**. The estimated replacement cost of all of the pavement is **\$25,323,019**.

*Figure 1: Asphalt Road and Parking Lot Locations*



# CONDITION

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## Condition Assessment Process

Road and parking lot pavement condition assessment is coordinated through Washoe County's Pavement Preservation Program. A Pavement Condition Index (PCI) Scan is completed every 3 years, the most recent of which was completed in summer of 2020. The PCI Scan process utilizes laser scanners equipped to trucks to take thousands of pavement distress data points and compiles them to determine the overall PCI condition score. The PCI score and corresponding condition categories are shown below,

*Figure 2: Pavement PCI Score and Corresponding Condition*



## Condition Results

Park Pavement scored an average 71.2 out of 100, which equates to “Satisfactory” but is nearing “Fair”. This is a few points lower than Washoe County’s PCI goal of 73

67% of pavement was either “Satisfactory” or “Good” condition, only need routine maintenance. 8.9% of pavement is below ‘Poor’ condition, which is considered beyond the point of needing maintenance, and needs to be fully reconstructed. A full breakdown of condition by percentage and square feet can be found below.

### Summary

- Whites Creek Park, Huffaker Hills Trailhead, Ballardini Ranch Trailhead, and Forest Park are all in the best condition, scoring above 97
- Phillip And Annie Callahan Park, Sierra Sage Golf Course Parking, and Cold Springs Park scored the lowest at below 35

Figure 3: Pavement Condition Pie Graph

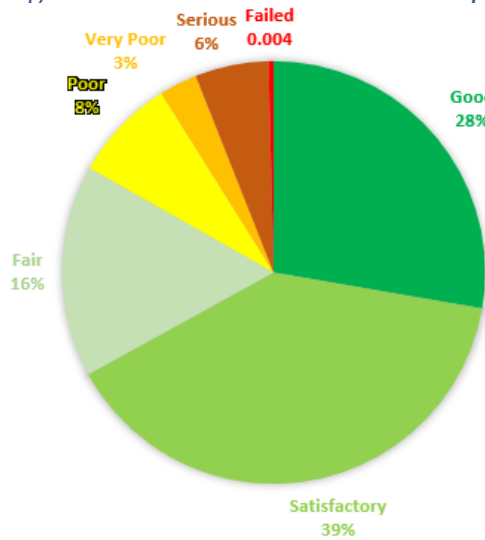


Figure 4: Pavement Condition Frequency

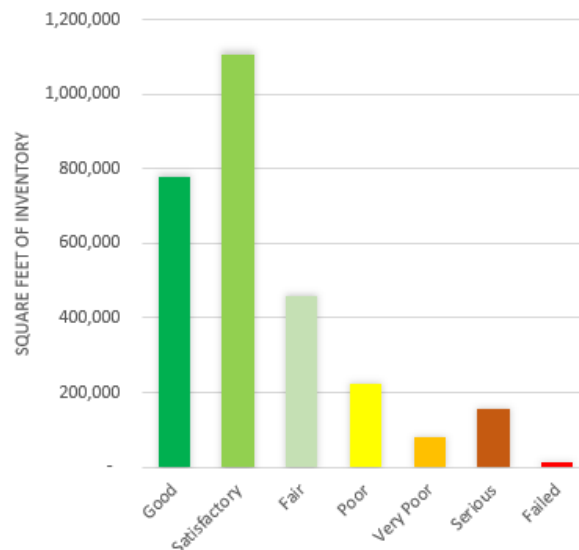


Table 1: Pavement Condition Results by Park

Park	Total Square Feet	Average PCI Score	Average PCI Condition
DAVIS CREEK REGIONAL PARK	362,855	74.7	Satisfactory
NORTH VALLEY SPORTS COMPLEX	329,402	65.5	Fair
RANCHO SAN RAFAEL PARK	308,547	77.6	Satisfactory
GALENA CREEK PARK	223,877	84.6	Satisfactory
LAZY 5 REGIONAL PARK	196,958	69.4	Fair
BOWERS MANSION REGIONAL PARK	164,273	76.8	Satisfactory
HIDDEN VALLEY REGIONAL PARK	162,143	74.4	Satisfactory
WASHOE COUNTY GOLF COURSE	142,874	58.7	Fair
SOUTH VALLEYS REGIONAL PARK	135,070	68.4	Fair
SUN VALLEY REGIONAL PARK	96,950	82.5	Satisfactory
BARTLEY RANCH REGIONAL PARK	89,897	81.9	Satisfactory
EAGLE CANYON PARK	80,829	70	Fair
SIERRA SAGE GOLF COURSE PARKING	64,162	26	Very Poor
SPARKS LIBRARY	53,152	88	Good
LEMMON VALLEY PARK	41,249	97.1	Good
CRYSTAL PEAK PARK	38,830	60.1	Fair
BALLARDINI RANCH TRAILHEAD	36,178	98	Good
ANDERSON PARK	25,486	83.3	Satisfactory
SKY RANCH PARK	25,132	62	Fair
MAYBERRY PARK	23,500	49	Poor
WHITES CREEK PARK	22,802	99	Good
COLD SPRINGS PARK	19,703	21	Serious
HIGHLAND RANCH PARK	17,412	85	Satisfactory
MICHAEL D THOMPSON TRAILHEAD	17,154	78	Satisfactory
ARROWCREEK PARK	15,887	92	Good
EAST KEYSTONE CANYON TRAILHEAD	15,172	50	Poor
DOROSTKAR PARK	15,145	60	Fair
SILVER KNOLLS PARK	12,751	50	Poor
HUFFAKER HILLS TRAILHEAD	10,791	99	Good
MOGUL PARK	9,694	81	Satisfactory
NEW WASHOE CITY PARK	8,815	54	Poor
MARTIN LUTHER KING JR MEMORIAL PARK	7,788	87	Good
AUDREY HARRIS PARK	7,369	53	Poor
PHILLIP AND ANNIE CALLAHAN PARK	7,301	33	Very Poor
FOREST PARK	6,507	98	Good
ELLEN'S PARK	5,273	70	Fair
AMBROSE PARK	4,649	59	Fair
VIRGINIA FOOTHILLS PARK	4,211	38	Very Poor
BAILEY CREEK PARK	3,037	94	Good
WILSON COMMONS PARK	525	81	Satisfactory
HORSEMAN'S ARENA (LEMMON VALLEY)	319	82	Satisfactory

## CURRENT CAPITAL NEEDS

Currently there is a \$4.52 Million in labor and parts needed to maintain, repair, and restore pavement to a “Good” condition.

*Table 2: Pavement Capital Needs by Condition*

Condition	PCI ≥	Treatment Need	Repair Cost PSF	Square Feet in Inventory	Capital Need
Good	86	None	\$0.00	780,123	\$0
Satisfactory	71	5% crack seal, patching, cape seal	\$0.48	1,104,776	\$530,292
Fair	56	10% crack seal, patching, cape seal, light R&R	\$1.75	456,740	\$799,295
Poor	41	25% crack seal, patching, cape seal, heavy R&R	\$4.25	221,505	\$941,396
Very Poor	26	Full Reconstruct	\$9.00	81,731	\$735,579
Serious	11	Full Reconstruct	\$9.00	157,761	\$1,419,849
Failed	0	Full Reconstruct	\$9.00	11,033	\$99,297
			<b>Total</b>	<b>2,813,669</b>	<b>\$4,525,708</b>



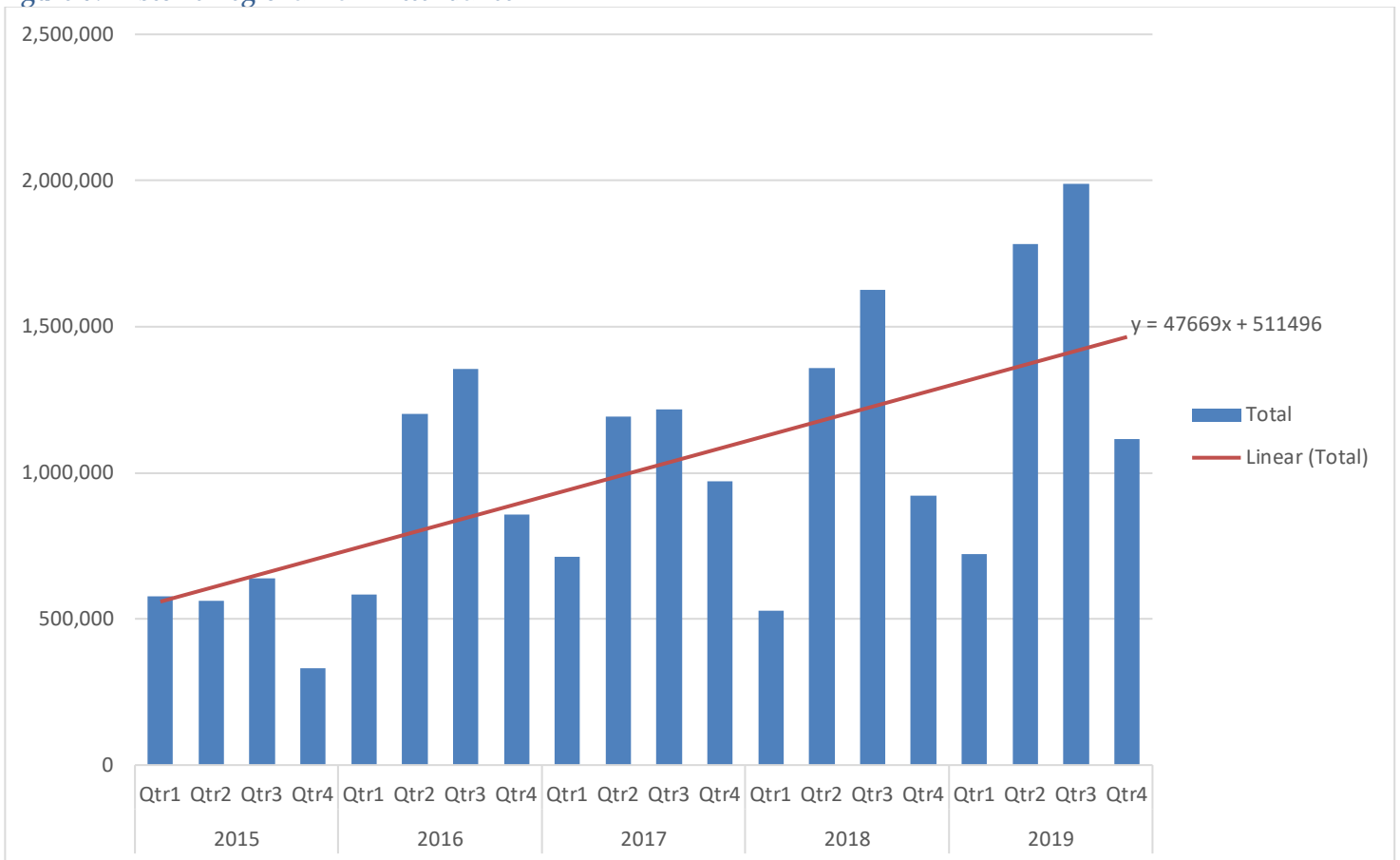
## DEMAND/ PARK ATTENDANCE

Park attendance at larger regional parks has been tracked historically using car counters. From 2016 to 2019 there has been a steady increase of 12.4% per year (5,278 users per month). But during early 2020, parks saw an average increase of 20% compared to early 2019. The largest increase was at Hidden Valley Regional Park, which had an increase of 261%. Most parks saw an increase but some parks trended down. South Valley Regional Park attendance decrease by 58%, which can most likely be attributed to mandates prohibiting specific usage like sports.

% change in attendance, early 2020 compared to early 2019:

- +261% Hidden Valley
- +260% Bartley Ranch
- +46% Davis Creek
- +10% Galena Creek
- +4% Truckee River Green Belt
- -3% Lazy 5
- -17% Bowers Mansion
- -58% South Valley Regional Park

Figure 5: Historic Regional Park Attendance



## Parks

Figure 6: Hidden Valley Regional Park Attendance

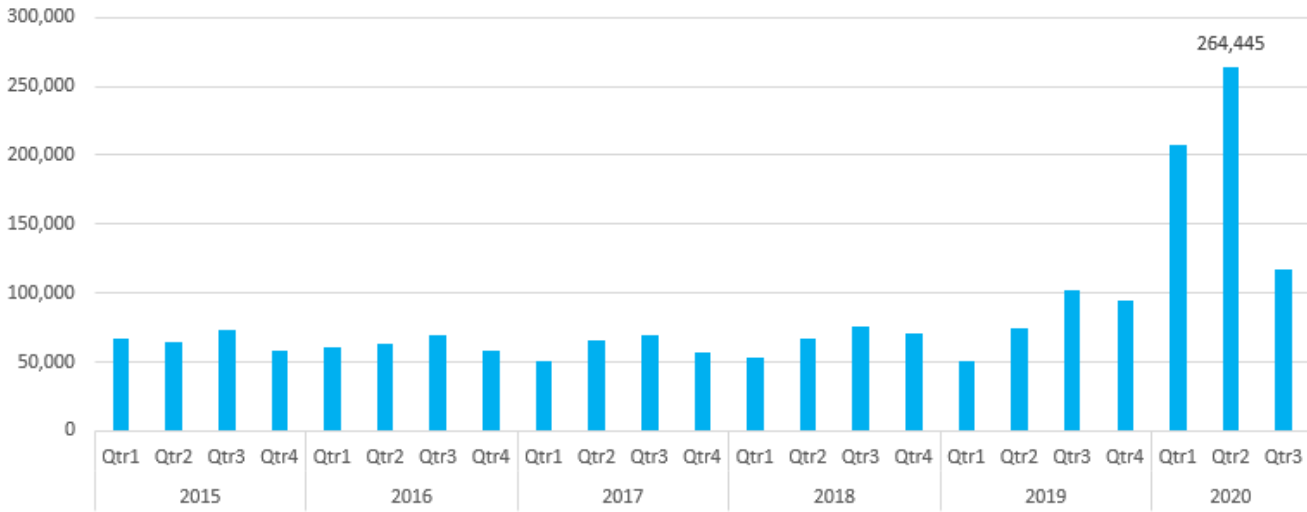


Figure 7: Bartley Ranch Regional Park Attendance

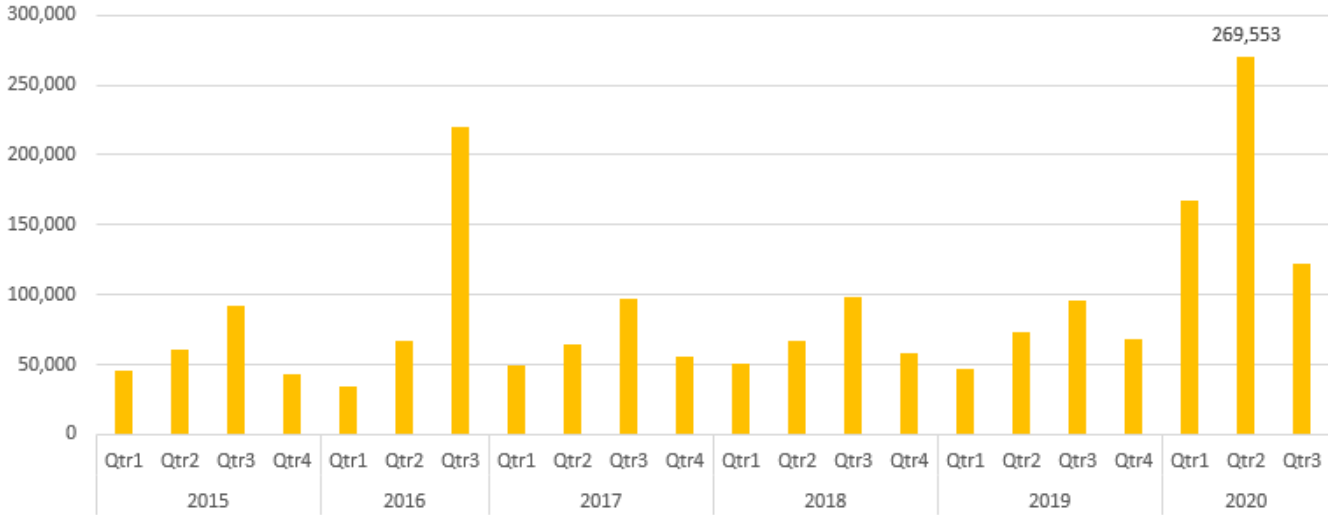
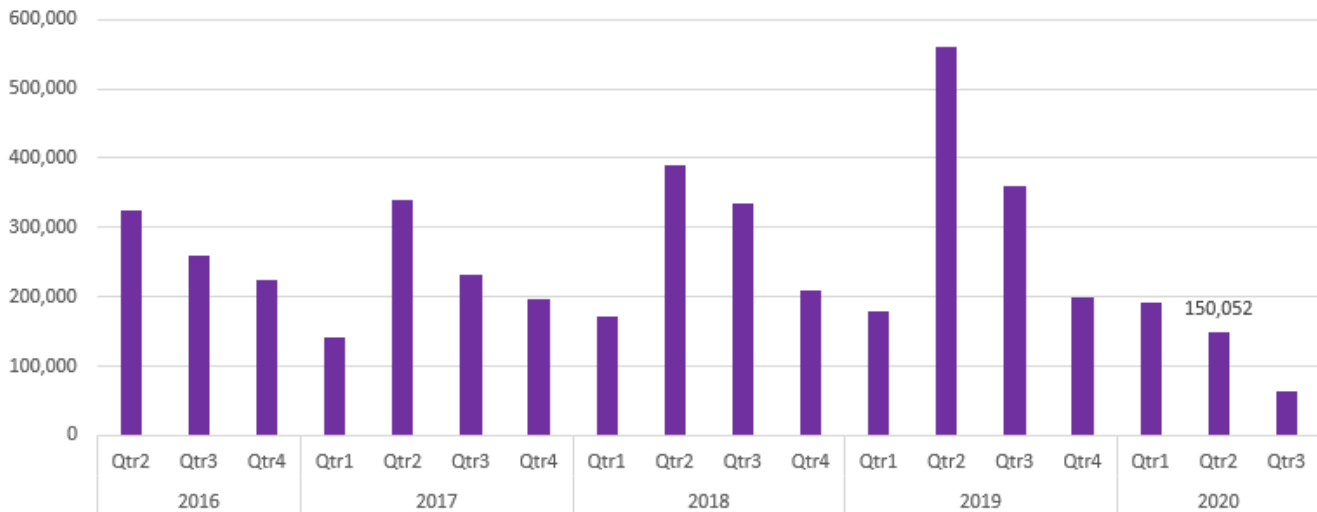


Figure 8: South Valley Regional Park Attendance



## RISK ANALYSIS

With almost unlimited needs and limited resources, Parks is forced to prioritize allocation of limited resources. This is accomplished by calculating the risk an asset poses. Risk is a factor of the asset's condition, aka likelihood of failure, and the consequences of failure. The Pavement Condition Index serves as out likelihood of failure. The consequence of failure was calculated using Park Attendance as a measure of how many customers are likely to be impacted if the asset failed.

The results were grouped into Low to High risk categories based on their scores, which are profiled below. Using these risk scores, we can see that there is 51,946 square feet of pavement that are at medium-high to high risk. These have the highest Return on Investment and are considered immediate needs. The total repair cost of this category is \$346,655.

There is also 270, 583 square feet that is in Fair condition and has Minor-Moderate consequence. This is a near term need and has a total repair cost of \$473,520, if done in the near future. But if these sections are allowed to fall into Poor condition, the repair costs will be \$1,149,997, 59% more expensive, not including inflation.

### Risk Profile by Number of Assets

Risk	Total	%	Consequence of Failure	Severe	5	0	0	0	0	0
High	37,319	1.3%		Significant	4	0	460,606	0	19,418	17,901
Med-High	14,626	0.5%		Moderate	3	53,220	136,484	56,311	6,025	0
Med	1,091,695	38.8%		Minor	2	100,587	134,721	214,272	0	8,601
Med-Low	570,160	20.3%		Negligible	1	626,316	372,965	186,157	196,061	224,023
Low	1,099,868	39.1%		Score		1	2	3	4	5
						Excellent	Good	Fair	Poor	Failed
<b>Grand Total</b>	<b>2,813,669</b>				<b>Likelihood of Failure</b>					

### Risk Profile by Replacement Cost

Risk	Total	%	Consequence of Failure	Severe	5	\$ -	\$ -	\$ -	\$ -	\$ -
High	\$ 335,875	1.3%		Significant	4	\$ -	\$ 4,145,454	\$ -	\$ 174,765	\$ 161,110
Med-High	\$ 131,636	0.5%		Moderate	3	\$ 478,980	\$ 1,228,355	\$ 506,801	\$ 54,225	\$ -
Med	\$ 9,825,259	38.8%		Minor	2	\$ 905,285	\$ 1,212,490	\$ 1,928,446	\$ -	\$ 77,411
Med-Low	\$ 5,131,436	20.3%		Negligible	1	\$ 5,636,840	\$ 3,356,689	\$ 1,675,413	\$ 1,764,553	\$ 2,016,204
Low	\$ 9,898,814	39.1%		Score		1	2	3	4	5
						Excellent	Good	Fair	Poor	Failed
<b>Grand Total</b>	<b>\$ 25,323,019</b>				<b>Likelihood of Failure</b>					

### Risk Profile by Repair Needs

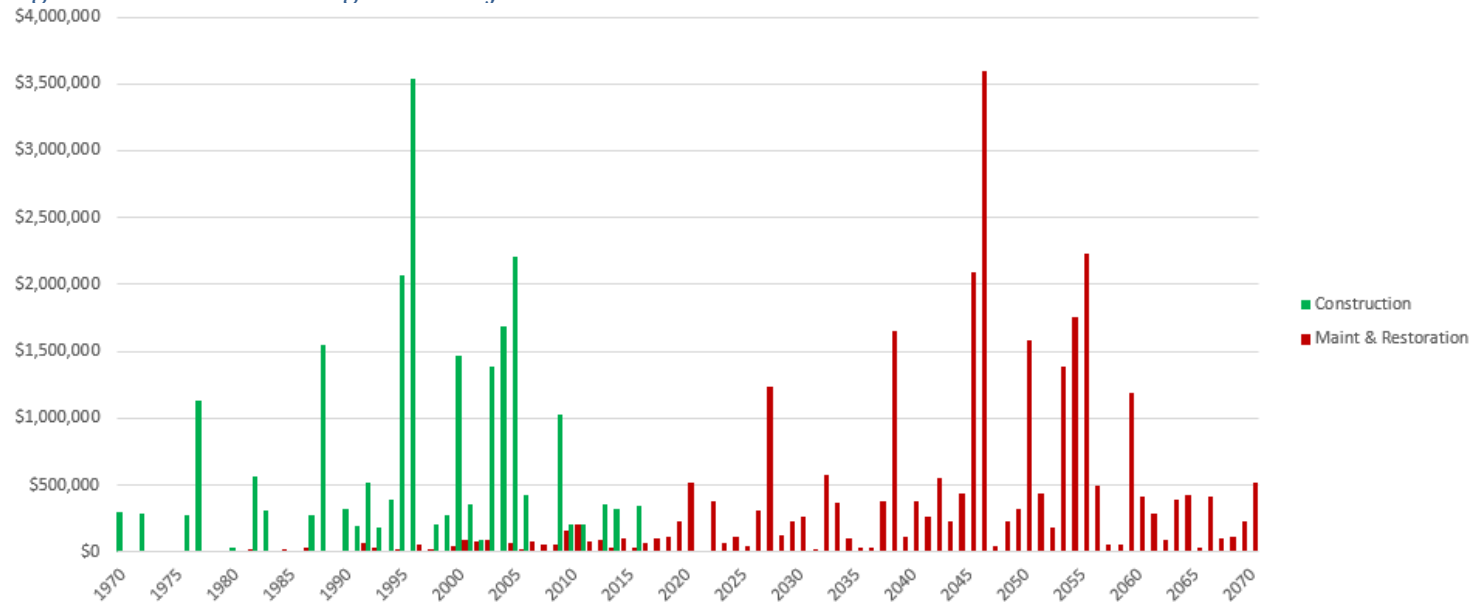
Risk	Total	%	Consequence of Failure	Severe	5	\$ -	\$ -	\$ -	\$ -	\$ -
High	\$ 243,638	5.4%		Significant	4	\$ -	\$ 221,091	\$ -	\$ 82,528	\$ 161,110
Med-High	\$ 103,017	2.3%		Moderate	3	\$ -	\$ 65,512	\$ 98,545	\$ 25,606	\$ -
Med	\$ 2,776,327	61.3%		Minor	2	\$ -	\$ 64,666	\$ 374,976	\$ -	\$ 77,411
Med-Low	\$ 1,223,702	27.0%		Negligible	1	\$ -	\$ 179,023	\$ 325,775	\$ 833,261	\$ 2,016,204
Low	\$ 179,023	4.0%		Score		1	2	3	4	5
						Excellent	Good	Fair	Poor	Failed
<b>Grand Total</b>	<b>\$ 4,525,707</b>				<b>Likelihood of Failure</b>					

## FUTURE FUNDING'S IMPACT ON PAVEMENT CONDITION

The historic pavement restoration and maintenance spending will not be enough in the coming years. Spending has averaged \$136,853 per year and has generally kept the PCI at the desired goal of 73 or greater. The historic spending has been enough to keep up with routine maintenance like micro and cape sealing but there are a growing number of pavement sections that will need full reconstruction. For example, in the late 1990's there was a large construction boom. Between 1991 and 2000 almost 1 million square feet of pavement was laid, roughly the same area as 3 football fields. Pavement has an estimated life expectancy of 50 years. Those sections constructed in the 1990's will need to be reconstructed in the 2040's. There were similar construction booms in 1977, 1988, and mid 2000's. Over the next 50 years that number is expected to grow to \$778,614 annually to keep up with reconstructions.

The graph below shows the future funding needs in red, the green area shows the initial construction costs.

Figure 9: Pavement Funding Needs Projection



## NEW CONSTRUCTION FISCAL IMPACT

When adding new pavement to the inventory, \$49.93 per square foot is needed to fully fund its installation, maintenance, and the first reconstruct, in today's dollars. Below is the breakdown of the maintenance treatments, the present value of those treatments, and the net present value, which is the amount needed in savings to pay for those treatments in the future.

*Table 3: Pavement Lifecycle Cost Per Square Foot*

Year	Maintenance Treatment	Inflation Adjusted Cost <sup>1</sup>
0	<b>Initial Construction</b>	<b>\$9.00</b>
4	<b>Micro Seal</b>	<b>\$0.25</b>
14	<b>Cape Seal</b>	<b>\$1.06</b>
24	<b>Cape Seal</b>	<b>\$1.90</b>
34	<b>Cape Seal</b>	<b>\$3.41</b>
	<b>Total Lifecycle Cost</b>	<b>\$15.62</b>
	<b>Net Present Value<sup>2</sup></b>	<b>\$12.11</b>

With proper maintenance, pavement is expected to have a 50 year lifecycle before needing a full reconstruction. To plan for that maintenance, below is the cost in today's dollars.

*Table 4: 50 Year Pavement Reconstruction Cost Per Square Foot*

Year	Maintenance Treatment	Inflation Adjusted Cost <sup>1</sup>
50	<b>Full Reconstruct</b>	<b>\$165.78</b>
	<b>Net Present Value<sup>2</sup></b>	<b>\$37.82</b>

<sup>1</sup> 6% average asphalt inflation annually from 1981-2020

<sup>2</sup> 3% discount rate annually

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## **SUMMARY**

In order to keep up with deteriorating assets, growing demands, and flat funding Washoe County Parks is leveraging technology, asset management best practices, and data to make informed decisions. Parks is able to better understand what they own, what condition it is in, what risk it poses, what funding is needed, and how to create the most value with the available resources. To provide the most value, infrastructure preservation spending is being prioritized based on objective risk and customer expectations. This report highlights the wonderful job staff has accomplished thus far but also the challenges that lay ahead.



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