Final Report
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EFFECTIVENESS OF CAPE SEAL PAVEMENT PRESERVATION TECHNIQUE IN NORTHERN NEVADA

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16. Abstract

This report presents the results of a research study funded by SOLARIS University Transportation Center. The research evaluated the long-term performance of cape seals with micro-surfacing and slurry seal in the Truckee Meadows and Incline Village areas of Northern Nevada. The analysis of the data generated from this research led to the following findings and recommendations:

- Among the six factors that were evaluated (Construction, Materials, Traffic, Structure, Environment, and Pre-PCI) only the pre-PCI (PCI prior to application of cape seal) value had a significant impact on the long-term performance of the cape seals.
- Micro-surfacing cape seals exhibited very consistent long-term performance regardless of the conditions of the existing pavement as expressed by the pre-PCI level. This is shown by the narrow range of the final PCI values of all micro-surfacing cape seals of 70 – 80.
- The effective performance life of micro-surfacing cape seals is 7 years in the Truckee Meadows and 5 years in Incline Village. The effective performance life of slurry seal cape seals is 3.5 years in the Truckee Meadows and 3 years in Incline Village.
- The LCCA indicates that the micro-surfacing cape seal is more cost effective than the slurry seal cape seal at both locations of Truckee Meadows and Incline Village.
- Based on the excellent long-term performance and the significantly higher benefit cost ratio of the micro-surfacing cape seals as compared to the slurry seal cape seals, road agencies should continue to use the micro-surfacing cape seal as a preventive maintenance treatment.

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SI* (MODERN METRIC) CONVERSION FACTORS				
APPROXIMATE CONVERSIONS TO SI UNITS				
Symbol	**When you know**	**Multiply by**	**To find**	**Symbol**
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
NOTE: volumes greater than 1000 L shall be shown in m^3				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
FORCE and PRESSURE or STRESS				
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa
APPROXIMATE CONVERSIONS TO SI UNITS				
Symbol	**When you know**	**Multiply by**	**To find**	**Symbol**
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE (exact degrees)				
°C	Celsius	1.8C+32	Fahrenheit	°F
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

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INTRODUCTION

As long as pavements are subjected to traffic loads and environmental actions, they will experience deterioration and eventual failure. A preventive maintenance program puts pavement engineers and managers in full control of the system's long-term behavior: to prevent significant failures from occurring. Through preventive maintenance, the agency can decide on the level of service provided by the facility and the length of time prior to a major rehabilitation activity. Figure 1 compares the two concepts: preventive maintenance and major rehabilitation in terms of the present serviceability index (PSI). Preventive maintenance ensures good conditions over extended time period while a major rehabilitation offers excellent conditions over a short time period.

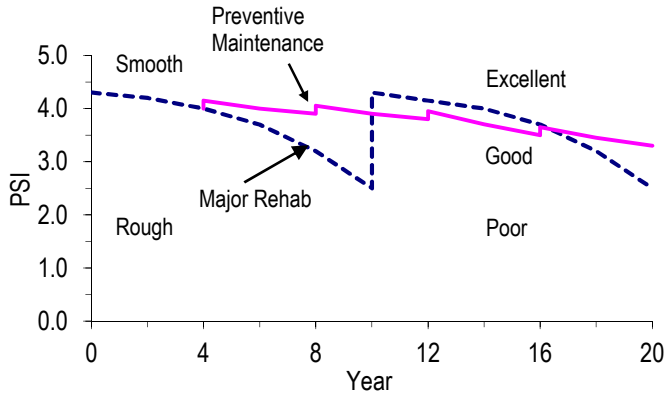


Figure 1. Typical performance of pavements subjected to rehabilitation and preventive maintenance.

Typical pavement users have short memory span: no one will remember the excellent conditions that prevailed during the first few years while they are stuck using a poor (rough) facility in years 7-10. On the other hand the boundary between excellent and good conditions (year 10) is very narrow and most users would not be able to differentiate between the two levels. The good level of serviceability coupled with the significant savings offered by a preventive maintenance program makes it a wise choice for most agencies.

The fundamental purpose of preventive maintenance is to slow down the deterioration process to avoid significant failures. Typically, the cost of preventive maintenance is 10-15% of the expected cost to repair the ultimate failure that will occur without the application of maintenance activities. For example, national data indicate that every $1 spent on maintaining the pavement surface saves $5 on major rehabilitation that will be required if the maintenance activities are not conducted.

A major difficulty in implementing a preventive maintenance program is estimating the long-term performance of the applied activities due to their dependency on the specific conditions of the existing pavement and the combination of materials and traffic conditions under which the activities have been applied. In other words, the long-term performance of maintenance activities is highly localized. Therefore, national generic performance models cannot be applied

to estimate the long-term performance of maintenance activities on a specific project within a given locality.

Road agencies can learn from the experiences of their neighboring agencies in terms of what works and what does not work for certain types of pavements. However, road agencies should not assume validity of the long-term performance of maintenance activities on their system when based solely on the performance from other locations. This is because each agency has unique materials, traffic volumes and composition, and environmental conditions, which are not uniform even throughout its own roadway system. For example, successful pavement preservation activities in the hotter climate and high traffic volumes of southern Nevada may not be successful in the colder climate and medium traffic volumes of northern Nevada.

Accordingly, public agencies in Nevada have been aggressive in their pursuit of the most cost-effective pavement preservation treatments and techniques for maintaining their roads. Among the various surface treatment methods, the method of combining a chip seal with a slurry seal or a micro-surfacing as shown in Figure 2 is referred to as "Cape Seal" and has been used extensively by NDOT as well as other local agencies and counties. The main difference between a slurry seal and a micro-surfacing is that slurry seal uses a standard asphalt emulsion with good aggregates while micro-surfacing uses a specialized polymer-modified asphalt emulsion (typically 3% polymer) with high quality aggregates.

Washoe County of Nevada has been using cape seals repeatedly to preserve its road network (total of 710 lane miles). The cape seal using slurry seal (type 3) has been regularly used in the Truckee-Meadows and desert stretches of Washoe County. However, for the highly trafficked mountain roads at higher elevations such as the Incline Village area at Lake Tahoe, the cape seal treatment using micro-surfacing has been mostly the standard of practice. While, the latter treatment is aimed to help protect pavements from frequent passes of snow plows and chained tires (due to the specialized polymer-modified emulsion), its long-term field performance has not been well studied and documented. Field observations indicate cape seals have better resistance to snow plows and chains damage than single seals.

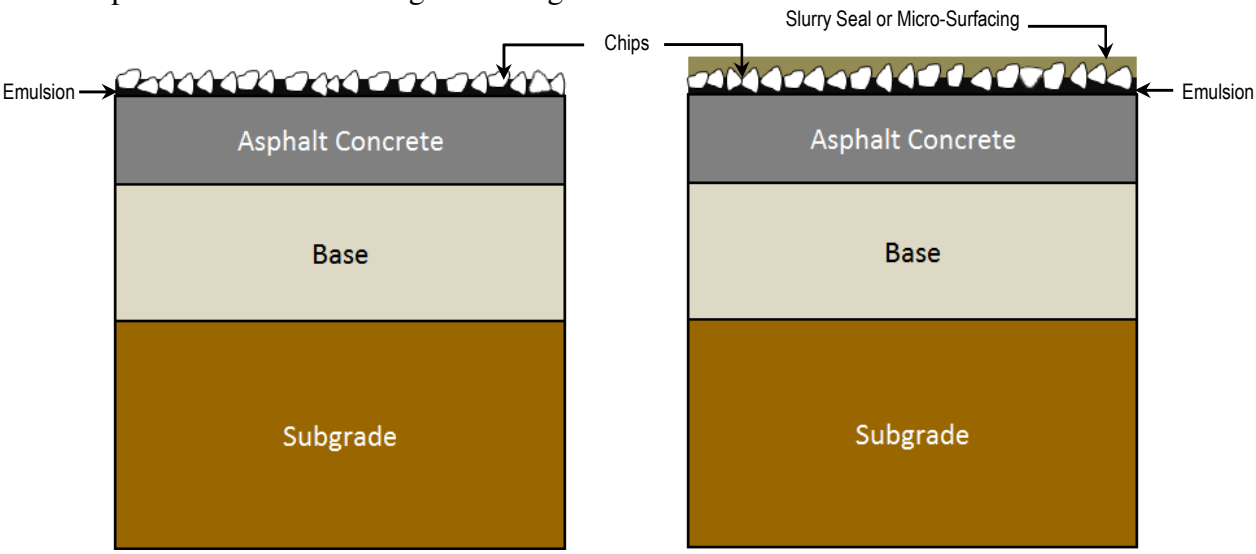


Figure 2. Illustration showing the Cape Seal technique.

OBJECTIVE

With the continuous limitations in budgets for pavement maintenance, NDOT expressed interest in learning from the experiences of Washoe County with the cape seal treatments using both slurry seal and micro-surfacing, and their abilities to extend pavement life at the least cost. Hence the main objective of this research project was to evaluate the performance and cost-effectiveness of cape seal treatments in northern Nevada.

RESEARCH PROGRAM

In order to achieve the research objective, the following activities were completed during the course of this study: (1) analysis of the Washoe County pavement management system data to assess the field performance of cape seals and (2) evaluate the impact of the slurry and micro-surfacing cape seals on the long-term performance of pavements under various traffic, structural, and environmental conditions.

Task 1: Review of Washoe County Cape Seals Program

Washoe County's first use of cape seals was in 1999. The constructed cape seals consisted of a 3/8" chip seal followed by a type 2 slurry seal. At the time, five roadways in the Truckee Meadow were treated with a cape seal placed over a fabric based on the experience of the City of Sand Diego, CA. After observing field performance of the cape seals, Washoe County started routinely placing cape seals as part of its preventative maintenance program in 2001. Based on the observed field performance, starting in 2006 Washoe County elected to only construct cape seals utilizing micro-surfacing based on their better resistance to damages caused by snow plows and chains.

Washoe County uses the Micro Paver system to manage its pavement system. Micro Paver uses the concept of the Pavement Condition Index (PCI), which is calculated based on the observed distresses on the pavement surface. The PCI ranges from 0 to 100; a newly constructed pavement has a PCI value of 100. The PCI is calculated through empirical functions in the Micro Paver based on the combination of extent and severity of various observed surface distresses including: rutting, cracking, bleeding, raveling, etc.

Washoe County begins the project selection process with a review of the Micro Paver information concerning traffic category (defined later) and PCI values. The Washoe County's target PCI value for cape seals on pavements with traffic categories A – C is: 60 – 70. However, cape seals have been placed on roadways with PCI values in the range of 40 – 90 based on the need of the roadway. In addition to traffic category and PCI value, Washoe County uses other factors such as budget availability, 5-7 year treatment cycle, and proximity of various projects to identify pavement candidates for cape seal treatment. Although the initial selection process begins with the PCI from Micro Paver, the ultimate project selection is made using a combination of the above-mentioned factors.

For this research, Washoe County Engineering Department provided a query of all projects that currently had a cape seal as the last treatment applied. However, this list did not

include those roadways where a cape seal was previously placed and later covered with an additional and separate treatment. In order to capture these roadways, the Washoe County project selection spreadsheet for their annual work program were obtained and reviewed. In reviewing the actual work program, previous cape seal projects that had been overlaid with an additional treatment could be included in the evaluation. After an initial review of the database and work program review, 95 roadways were identified that had the application of a cape seal covering a service life of one to fifteen years. For the final data collection and performance analysis, a representative number of projects were selected using the following five criteria described below.

1. ***Cape Seal Type***
   A cape seal is a two-treatment application consisting of a chip seal and a slurry or micro-surfacing. Since both treatments are applied together, it is not possible to separate the performance of the chip seal and slurry or micro-surfacing. A review of the projects information indicated that chip seals over all of the selected projects were constructed following the same materials specifications. As such, any performance difference observed between a cape seal constructed with a slurry seal and a cape seal constructed with a micro-surfacing would be attributed to the slurry seal or micro-surfacing layer.

2. ***Age***
   Due to the short service life, and relatively few PCI ratings to develop a performance curve, cape seals less than three years of age were eliminated from the study. It was also decided to not use the original cape seals placed in 1999 due to the cape seal being placed over a fabric, which would affect the performance comparisons of cape seals placed directly over a bituminous pavement surface. The final projects were selected in the range of 4 to 13 years old cape seals.

3. ***Location/Environment***
   Washoe County uses the combination of geographical location and environmental condition to identify each pavement section within one of the following ten location groups.

Incline Village	INVIL1
Reno/Sparks Valley	TM 1, 3, 4, 5, 6
North Valleys	TM 2
Verdi	TM 7
Toiyabe Foothills	TM 7
Wadsworth	WADSWRT
Gerlach	GERLACH

   The aim was to evaluate the performance of cape seals over a wide range of locations/environments within Washoe County. Wherever possible, projects were selected throughout the Truckee Meadows to obtain a representative number of projects for comparison to the extreme environment of Incline Village.

4. ***Traffic Level***

   In the Micro Paver database, Washoe County classifies roadways into five traffic categories.

Arterial	A
Collector	B
Local Residential	C
Industrial	D
Rural Highway	E

   The roadway classification was used in the selection process in order to have representative projects in each classification to evaluate the effect of traffic volume on the expected performance of cape seals.

5. ***Project Size***

   In order to get a true measure of performance, the cape seal constructed section must be of sufficient length to allow for consistent application during construction and to obtain a representative measure of the performance of the treatment. The projects with the greatest treatment area were selected for evaluation when other selection criteria were similar.

As noted earlier a complete list of all cape seal applications resulted in a total of 95 roadway projects prior to the implementation of the selection criteria. This includes the first cape seal projects placed in 1999 that utilized a fabric beneath the cape seal. After the implementation of the selection criteria, 51 roadways were identified for further analysis. Further elimination of projects with less than 4 years of service life resulted in a total of 29 roadway projects. Upon review of the Washoe County Micro Paver data it was discovered that many of the roadways are subdivided into multiple sections for condition rating and budgeting purposes. As such, the total number of sections that can be used in this evaluation is larger than the total number of roadway projects. As an example, Eastlake Boulevard is subdivided into 14 sections with each section having a separate condition rating that can be used in this analysis. The use of multiple sections within a roadway resulted in a total of 55 sections for the performance evaluation. Table 1 summarizes the final sections selected for performance evaluations.

It should be noted that the sections are listed and analyzed by age of the cape seal and not the year of application. No cape seals were placed in years 2003, 2004, and 2005 relating to ages of 11, 10, and 9 years, respectively. Also there are no cape seals shown with an age of 12 years as those projects were placed in 2002 and have been subsequently overlaid. However, these sections are used in the analysis with an age from construction to the time of overlay treatment. During the initial use of cape seals, slurry seals were used for the second application over the chip seal. However as time progressed and early performance was observed, Washoe County phased out the use of slurry seals in favor of micro-surfacing. This can be observed in the 13-year-old cape seals having all slurry seals and from 4 to 7 years a general trend of increasing percentage in the use of micro-surfacing in the cape seal. Appendix A lists the details of the final sections selected for performance analysis.

Task 2: Collect Pavement Information and Performance Data

After selection of the 55 cape seal sections, the 2014 Micro Paver database was obtained from Washoe County to extract the work history, section information, and PCI ratings for each of the selected cape seal sections. A section summary and PCI curve were developed for each section. Table 2 presents an example of a Section Summary created for Section 1 on Eastlake Boulevard and Figure 3 shows the PCI curve for the same section. Appendix B lists the construction work history, summary, and PCI history for each section. This information will be used in the evaluation of the long-term performance of cape seals.

Table 1: Characteristics of the Cape Seal Sections included in the Performance Evaluation.

Age (Service Life)													
	4	5	6	7	8	9	10	11	12	13	14	15	**TOTAL**
Number of Roadways	2	9	3	8	3	0	0	0	0	4	0	0	29
Number of Sections	3	15	5	21	6					5			55
Location/Environment													
Incline Village		11	3	4						3			21
Truckee Meadows	3	4	2	13	6								28
Gerlach				4						2			6
Traffic													
A - Arterial	2	2	2	11	3								20
B - Collector	1	11	1										13
C - Residential		2	2	6						3			13
D – Industrial					3					2			5
E – Rural Hwy				4									4
Surface Type													
Micro-Surfacing	3	13	3	10	4					0			33
Slurry Seal	0	2	2	11	2					5			22

Table 2: Example of Section Summary for East Lake Blvd.

Roadway	East Lake Blvd.	
Section	1	
Traffic Class	A - ARTERIAL	
PCI-before/Date	95	3-8-2001
Treatment/Year	CS-SS	6-12-2002
PCI-final/service year	82	7
Age	8	
Asphalt Concrete Layer	Total: 5.50” 1999: 3.00” 1987: 2.50”	

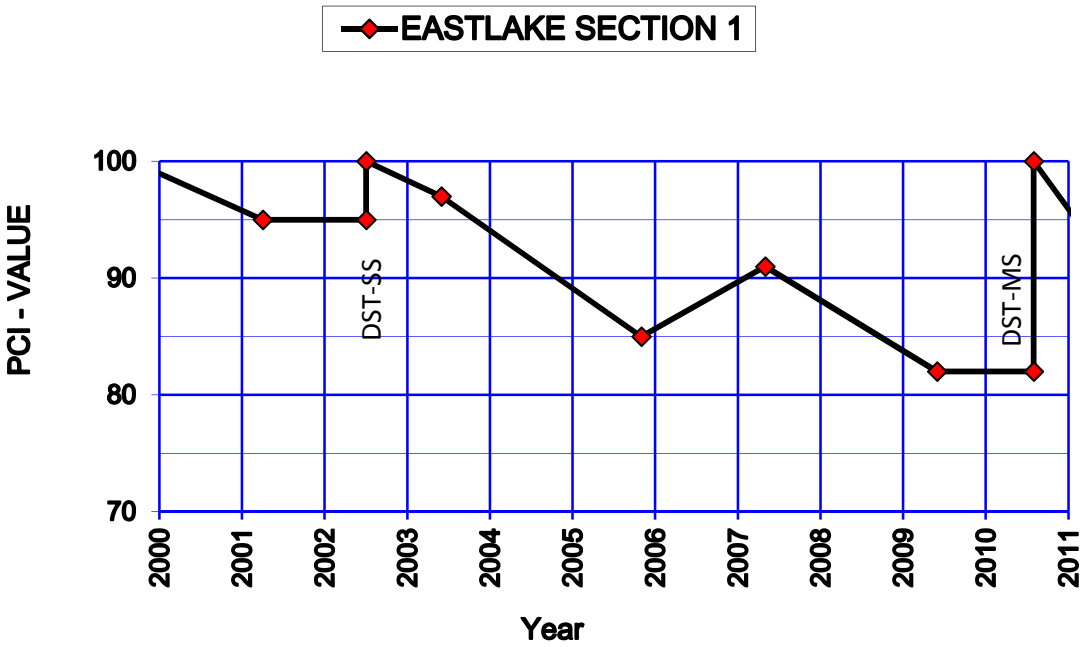


Figure 3. Performance of slurry seal cape seal on East Lake.

Available materials information was collected from Washoe County files for cape seals constructed in years 2000, 2001, 2002, 2006, 2007, and 2008. Yearly specifications were collected for chip seal emulsions, slurry seal and micro-surfacing emulsions, chip seal aggregates, slurry seal and micro-surfacing aggregates, and mix design requirements. Along with specifications requirements, field testing results for all materials used in the construction of the cape seals were collected. The grade of emulsion used in the construction of the chip seals, slurry seals, and micro-surfacing are shown in Table 3. A summary of available passing and failing field quality control test results is provided in Table 4. For the past few years the Washoe County has been using the high float emulsion for the chip seals.

Table 3: Grades of the Asphalt Emulsions used in the Construction of Cape Seals.

Year	Emulsion Grade		
	Chip Seal	**Slurry Seal**	**Micro-surfacing**
2000	PASS/LMCRS	LMCQS	N/A
2001	PASS	LMCQS	N/A
2002	PASS	LMCQS	N/A
2006	LMCRS	LMCQS	LMCQS
2007	LMCRS	RTE	RTE
2008	LMCRS	RTE	RTE
2009	LMCRS	RTE	RTE
2010	LMCRS	RTE	MSE

LMCRS: Latex-Modified Cationic Rapid Set Asphalt Emulsion
LMCQS: Latex-Modified Cationic Quick Set Asphalt Emulsion
PASS - "Proprietary" Polymer-Modified Emulsion
MSE – Micro-surfacing Surfacing Emulsion
RTE - Rapid Traffic Emulsion - Polymer-Modified

Table 4: Summary of Field Quality Control Data.

Year	Slurry Seal		Micro-Surfacing	
	Aggregate	**Emulsion**	**Aggregate**	**Emulsion**
2000	Pass	Pass	No Results	No Results
2001	No Results	No Results	No Results	No Results
2002	Pass	Pass	No Results	No Results
2006	No Results	No Results	No Results	Failing Residue Failing Softening Pt. Failing Torsional Recovery
2007	Pass	Failing Penetration Failing Softening Pt. Failing Torsional Recovery	Pass	Failing Penetration Failing Softening Pt. Failing Torsional Recovery
2008	Pass	No Results	Failing L.A. Abrasion	Failing Torsional Recovery

For slurry seal aggregate and emulsion the limited test results show the materials met the project specifications. For the micro-surfacing the single test results show the aggregate failing the L.A. abrasion specifications while the emulsion failing multiple specifications. However, from the data collected it is not possible to correlate the test results with the exact project location.

In a review of the project specifications for chip seals, slurry seals, and micro-surfacing the specification requirements remained fairly consistent throughout the duration of this study. This indicates that any changes in the materials used were not the result of direct specification changes. Therefore, combining cape seals by age rather than by year of construction should not affect the analysis.

Task 3: Data Analysis and Performance Modeling

The objective of this task is to conduct overall analysis of the data on the pavement sections that received cape seals in the Truckee-Meadows and Incline Village areas.

Impact of Construction Practices

The first step in the data analysis was to review roadways that had multiple sections of cape seals applied during the same year. This comparison can be used to evaluate the effect of construction practices used during placement of the cape seal. The roadways selected for this analysis had uniform pavement conditions and traffic over the multiple cape seal sections. Below is a summary of the analysis on the impact of construction practices on the performance of cape seals.

a. Incline Way: this road had two sections (1 & 2) treated with micro-surfacing cape seals in 2008. Both sections had 5.0 inches of asphalt concrete layer (AC) and similar traffic. After five years of performance the PCI value for section 1 went from 96 before treatment in 2008 to 85 in 2013. For section 2, the PCI value went from 91 before treatment in 2008 to 84 in 2013. Both sections had very similar performance of the cape seal treatment indicating uniform application.

b. Knotty Pine Drive: this road had two sections (1 & 2) treated with micro-surfacing cape seals in 2007. Both sections had 5.0 inches of asphalt concrete layer and similar traffic. After seven years of performance the PCI value for section 1 went from 73 before treatment in 2006 to 76 in 2013. For section 2, the PCI value went from 61 in 2006 to 78 in 2013. Both sections had similar performance of the cape seal treatment indicating uniform applications.

c. Alexander Lake Road: this road had three sections (1, 2, &3) treated with micro-surfacing cape seals in 2006. Sections 1 and 3 had 2.5 inches asphalt concrete layer and section 2 had 4.0 inches asphalt concrete layer. All sections are classified as an industrial roadway. The PCI's ranged from 18 to 35 before treatment in 2000 to 64 to 69 after eight years of service in 2014. All three sections had similar performance of the cape seal treatment indicating uniform applications.

d. White Lake Parkway: this road had two sections (1 & 2) treated with slurry seal cape seals in 2000. Both sections had 5.5 inches of asphalt concrete layer and similar traffic. After seven years of service, the PCI value for section 1 dropped from 99 before treatment in 1999 to 92 in 2007. For section 2, the PCI value dropped from 95 before treatment in 1999 to 92 in 2007. Both sections had similar performance of the cape seal treatment indicating uniform applications.

The purpose of this review was to verify that the applications of the cape seals were uniform across all roadway sections. The reviewed roadways with multiple sections demonstrated that under similar conditions of location, structural section, traffic, and year of application, the performance of the cape seals were not affected by the application procedures used during construction. This indicates that uniform standard practices have been used in the construction of cape seals in Washoe County over the past 15 years. Therefore, differences in the long-term performance of the two types of cape seals may be contributed to the differences in technologies between the slurry seal and micro-surfacing.

Impact of Materials Properties and Mix Design

Material specifications, mix designs, and field test results for slurry seals and micro-surfacing were obtained from Washoe County database. As previously discussed, there was not enough data or detailed testing results to analyze the effect of these factors on the performance of the cape seals using slurry seal or micro-surfacing. Some field testing indicated the failure of the micro-surfacing emulsion on the residue, penetration, softening point, and torsional recovery. In the cases where failing asphalt emulsions were used in the micro-surfacing, the contractor provided the County with extended warrantee.

In order to assess the impact of materials variations on the performance of cape seals, the performance of cape seals with micro-surfacing constructed in 2007 and 2008 in Incline Village were compared as shown in Figure 4. The 2007 projects were rated for PCI values at 1, 3, and 6 years of service life while the 2008 projects were rated at years 2 and 5. The 2008 projects tended to have slightly lower PCI values after 2 years of service as compared to the 2007 projects, which could be due to the timing of the data collection. In most cases, the performance

of the 2007 and 2008 micro-surfacing cape seals are similar indicating a minimal impact of the yearly variations in materials properties on the performance of the cape seals.

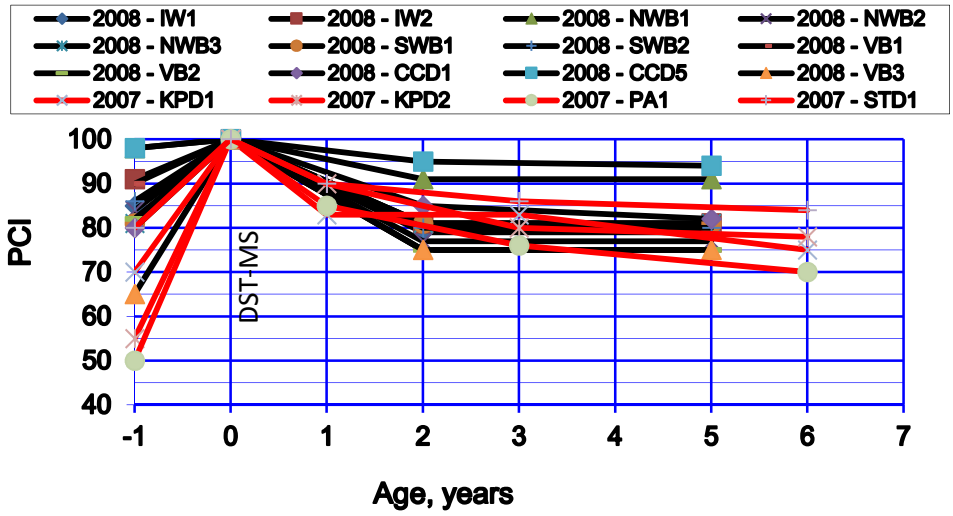


Figure 4. Performance of 2007 and 2008 micro-surfacing cape seals in Incline Village.

Impact of Traffic Level

In order to evaluate the impact of traffic level on the performance of cape seals, sections constructed on pavements with similar asphalt concrete layers were selected. Based on the available groups of sections, it was feasible to identify cape seals sections constructed over 5.0 – 5.5 inches asphalt concrete layer with multiple levels of traffic. Figures 5 and 6 present the performance of micro-surfacing and slurry seal cape seals, respectively. The 12 micro-surfacing cape seal sections shown in Figure 5 consist of; 3-arterial, 6-collector, and 3-residential. With the large variations in the pre- PCI (PCI value prior to application of cape seal) the direct impact of traffic is not clearly observed. It can be seen that regardless of the pre-PCI, the long-term performance of cape seals with micro-surfacing are fairly consistent amongst all the traffic levels. The 9 slurry seal cape seal sections shown in Figure 6 consist of: 7-arterial, and 3-industrial. The range of the pre-PCI values of the slurry seal cape seals is from 75 to 100. Although the effect of traffic cannot be clearly defined on the performance of the slurry seal cape seals, it is apparent that there is a wide variability in the long-term performance based on the ending PCI values.

The performance data presented in Figures 5 and 6 lead to the following observations:

- The performance of the micro-surfacing cape seals are similar under multiple levels of traffic even-though the pre-PCI values varied over a wide range of 40 – 90.
- The performance of the slurry seal cape seals are highly variable under a single traffic level (A or D) even-though the pre-PCI values varied over a narrow range of 75 – 100.

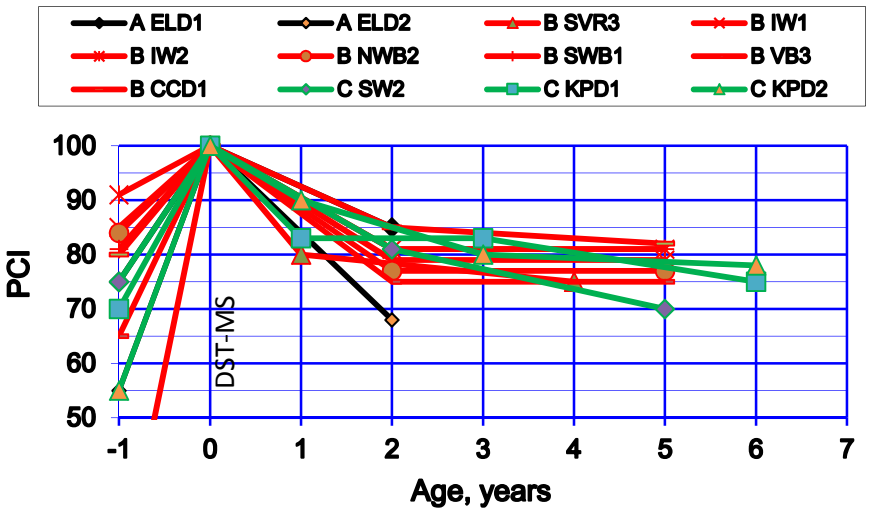


Figure 5. Performance of micro-surfacing cape seals under multiple traffic levels.

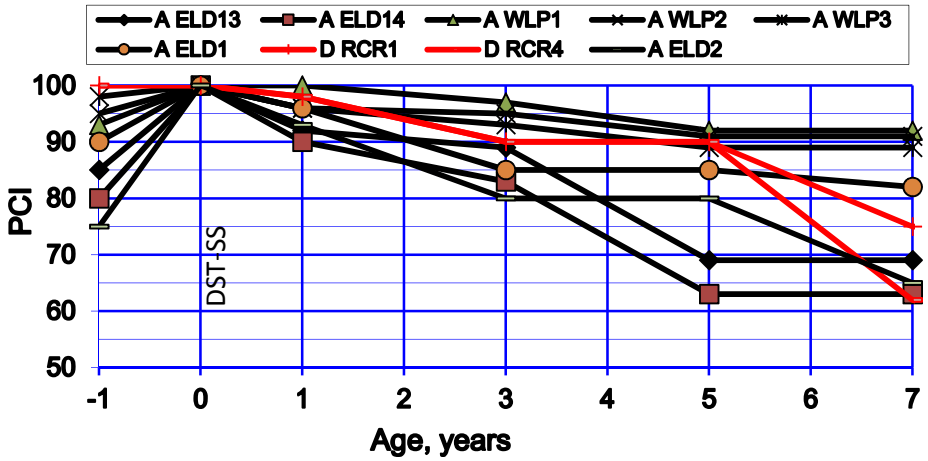


Figure 6. Performance of slurry seal cape seals under multiple traffic levels.

Impact of Pavement Structure

In this study, the impact of pavement structure on the long-term performance of the cape seals was evaluated in terms of the thickness of the asphalt concrete layer underneath the cape seal as obtained from construction records. Figure 7 compares the performance of micro-surfacing cape seals over 5 and 7.5 inches asphalt concrete layer with pre-PCI values of 82-90, Incline Village, and traffic category B. The measured PCI values of all sections ranged between 75 and 80 at

ages of 2 and 5 years indicating no impact of pavement structure on the performance of micro-surfacing cape seals.

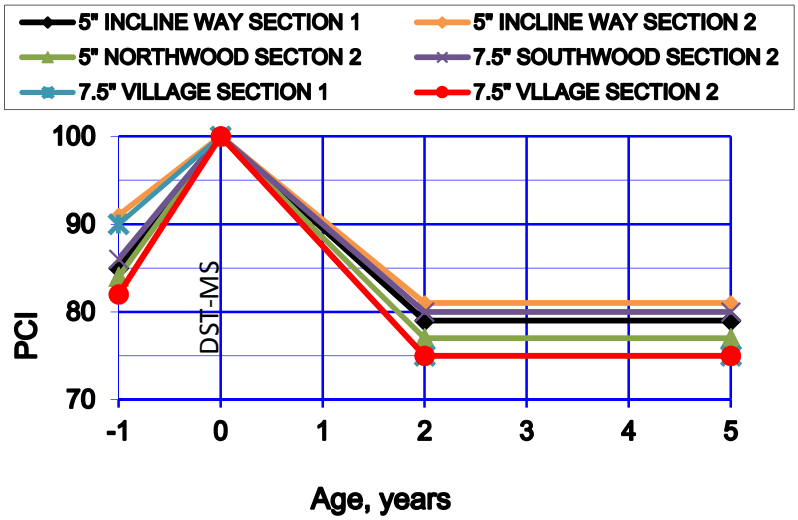


Figure 7. Performance of micro-surfacing cape seals over 5 and 7.5 inches AC layer.

Figure 8 compares the performance of slurry seal cape seals over 5 and 7.5 inches asphalt concrete layer with pre-PCI values above 90, Truckee Meadows, and traffic category A. The data in Figure 8 indicate that the cape seals applied over the thicker asphalt concrete layer of 7.5 inches performed worse than the sections over the thinner asphalt concrete layer of 5.5 inches under the same traffic and within the same location. Figure 9 compares the performance of slurry seal cape seals over 4.5 and 8.0 inches asphalt concrete layer with similar pre-PCI values around 65, Truckee Meadows, and traffic category C. In this case, the performance of the slurry seal cape seals under traffic category C is not impacted by the thickness of the asphalt concrete layer. Figure 10 compares the performance of slurry seal cape seals over the same roadway with two asphalt concrete layers of 3.0 and 8.0 inches with same pre-PCI values of 95, Truckee Meadows, and traffic category A. In this case, the slurry seal cape seal on the thicker pavement section significantly outperformed the cape seal on the thinner pavement section. The overall data indicate that the impact of pavement structure on the performance of slurry seal cape seals is inconsistent and dependents on the characteristics of the specific project. Therefore, no general observation can be made regarding the performance of slurry seal cape seals over various pavement structures.

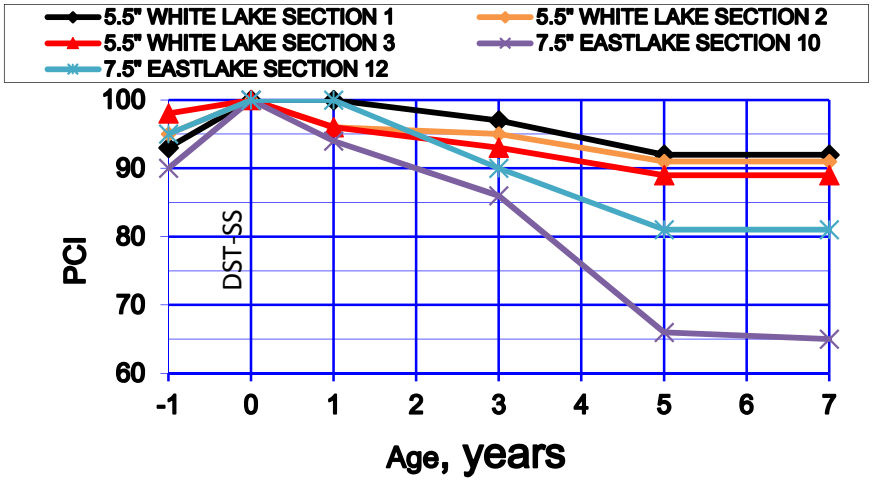


Figure 8. Performance of slurry seal cape seals over 5.5 and 7.5 inches AC layer.

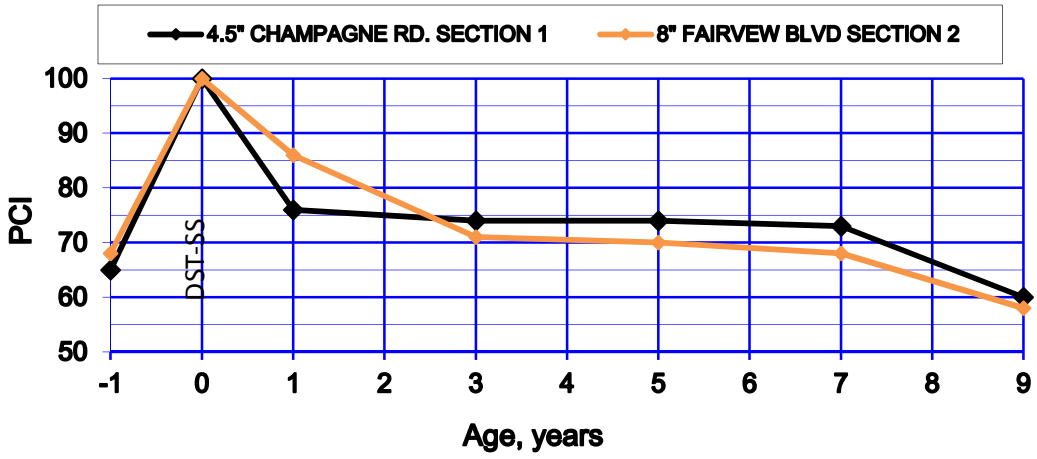


Figure 9. Performance of slurry seal cape seals over 4.5 and 8.0 inches AC layer.

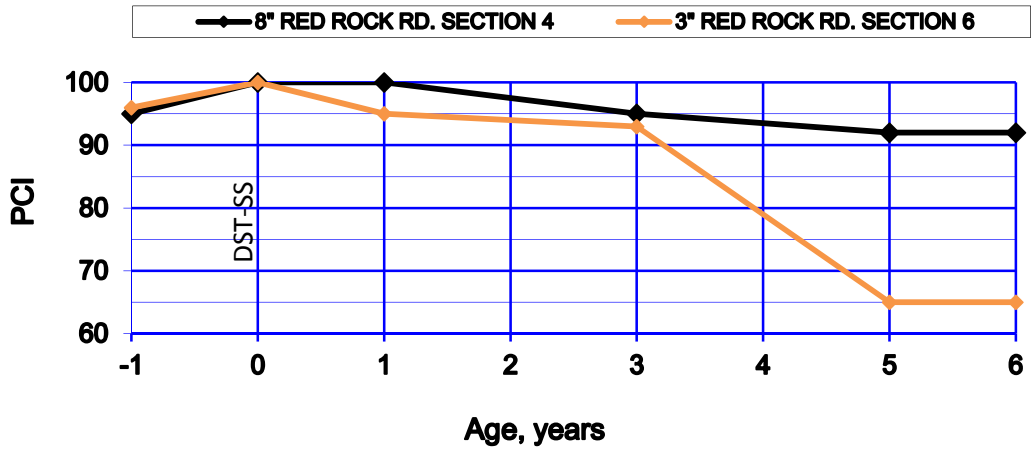


Figure 10. Performance of slurry seal cape seals over 3.0 and 8.0 inches AC layer.

Impact of the Environment

The impact of the environment on the performance of cape seals was evaluated by comparing projects located in Incline Village with projects located in the Truckee Meadows. Each group was further subdivided into PCI ranges to eliminate the effect of the pre-PCI values. Figures 11 and 12 compare the performance of micro-surfacing cape seals in Incline Village and Truckee Meadows with pre-PCI of 90 or higher and pre-PCI of 50 – 55, respectively. In both cases, there does not appear to be a direct and noticeable impact of the environment on the performance of micro-surfacing cape seals.

Figures 13 and 14 compare the performance of slurry seal cape seals in Incline Village and Truckee Meadows with pre-PCI of 85 or higher and pre-PCI of 70-80, respectively. There is a trend for the slurry seal cape seals to drop in PCI to the pre-PCI values in the first few years of service life in both Incline Village and in the Truckee Meadows.

In general, based on the projects reviewed in this study, any environmental differences between Incline Village and the Truckee Meadows does not appear to have a significant impact on the long-term performance of the micro-surfacing as compared to the slurry seal cape seals. Under all cases, the micro-surfacing cape seals were found to hold up better than the slurry seal cape seals against the surface damage caused by snow plows and chains.

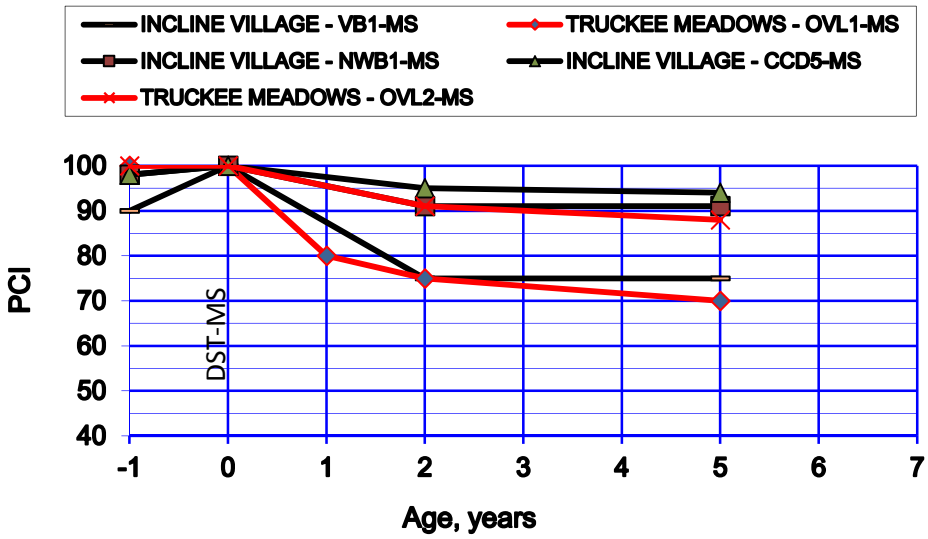


Figure 11. Performance of micro-surfacing cape seals in Incline Village and Truckee Meadows.

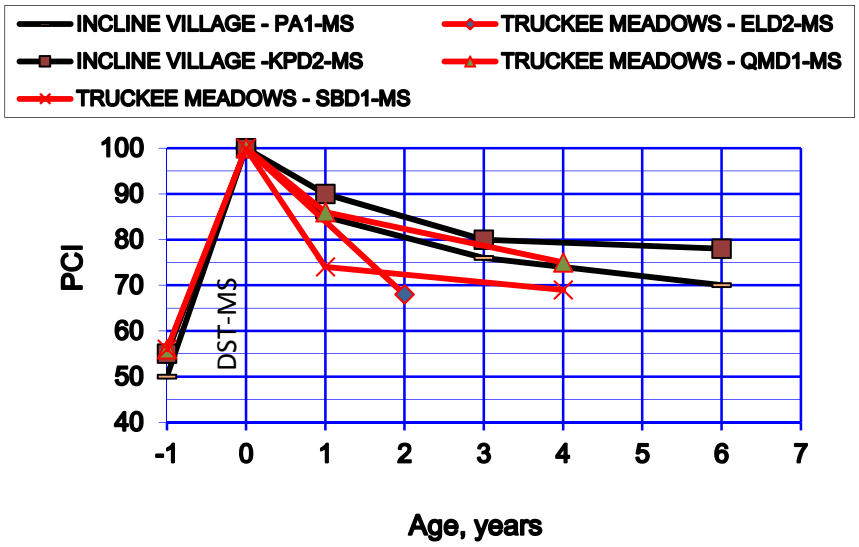


Figure 12. Performance of micro-surfacing cape seals in Incline Village and Truckee Meadows.

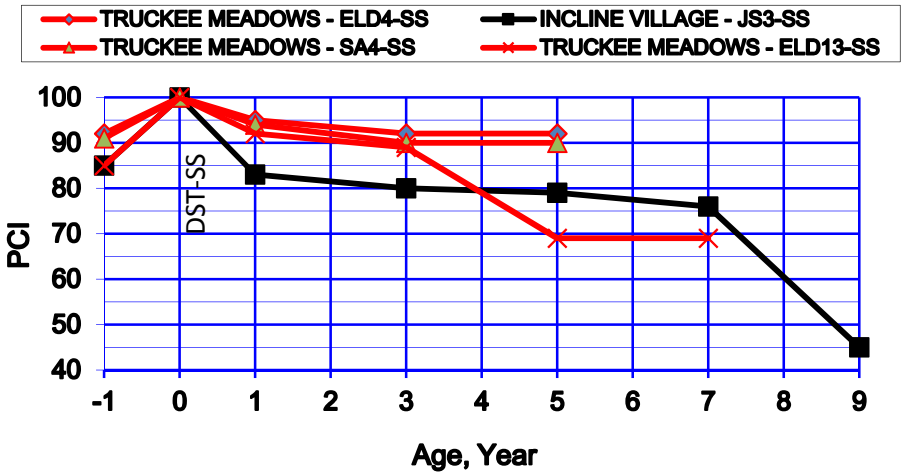


Figure 13. Performance of slurry seal cape seals in Incline Village and Truckee Meadows.

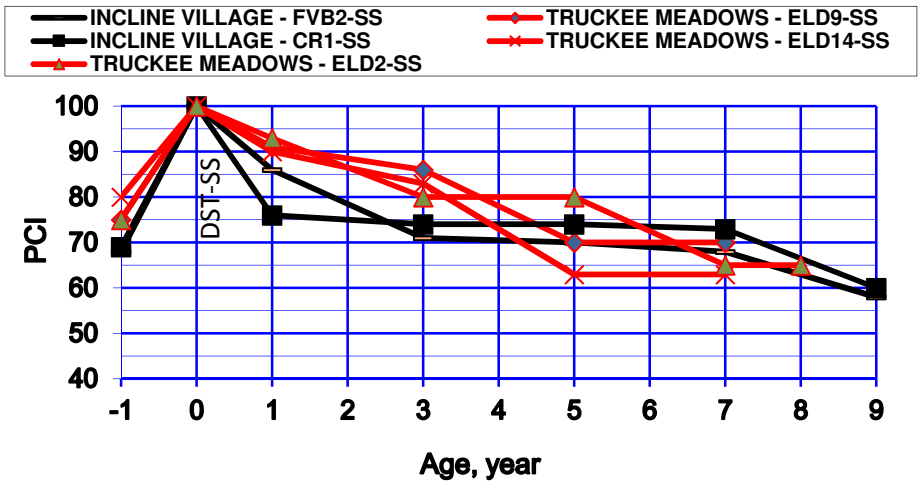


Figure 14. Performance of slurry seal cape seals in Incline Village and Truckee Meadows.

Impact of Pre-PCI

The condition of the asphalt pavement section before the application of the cape seal (i.e. pre-PCI) may have a significant effect on the treatment performance. Figure 15 compares the performance of 3 micro-surfacing cape seal sections under traffic category B with different pre-PCI levels. Although the pre-PCI values ranged from 65 to 90, after 5 years of service life the final PCI values are all within a close range. Figure 16 compares the performance of 4 micro-surfacing cape seal sections on the same roadway with pre-PCI values ranging from 30 to 76. After 7 years of service the final PCI values are all within a close range. Figure 17 compares the performance of several micro-surfacing cape seal sections with varying pre-PCI values under 65 (i.e. 10 – 65). After 5 years of service the PCI of the sections range from 40 to 80. When considering the range of roadways presented in Figure 17, the variation of the final PCI values of the micro-surfacing cape seals over the range of 40 to 80 is still relatively narrow compared to the range of the pre-PCI of 10 to 65. In general, the impact of the pre-PCI on the performance of the micro-surfacing cape seals is minimal.

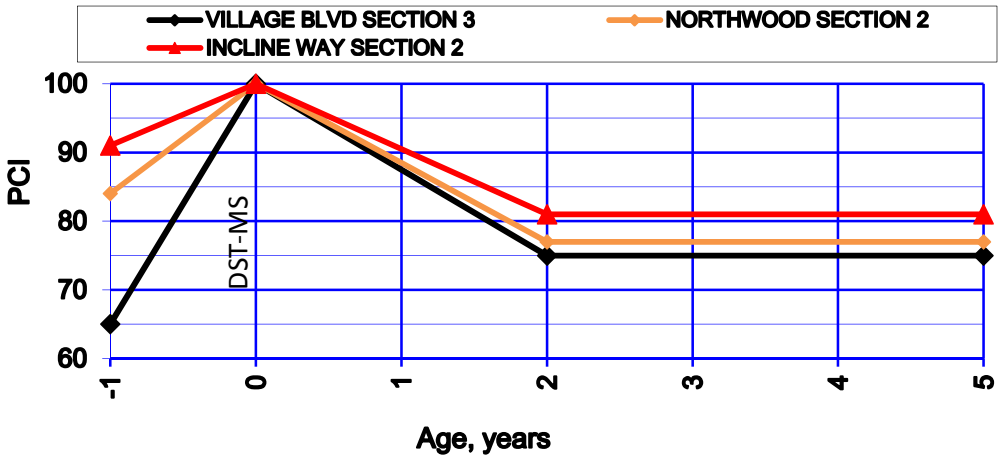


Figure 15. Performance of micro-surfacing cape seals on pavements with varying pre-PCI.

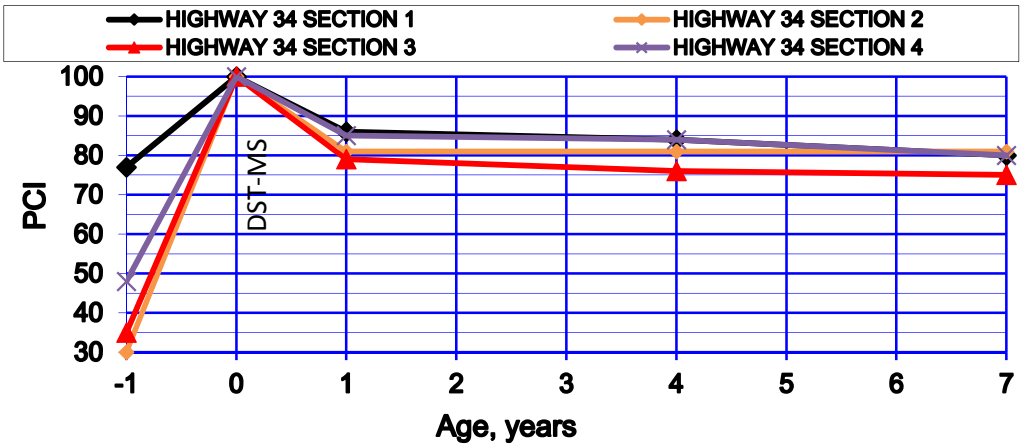


Figure 16. Performance of micro-surfacing cape seals on same roadway with varying pre-PCI.

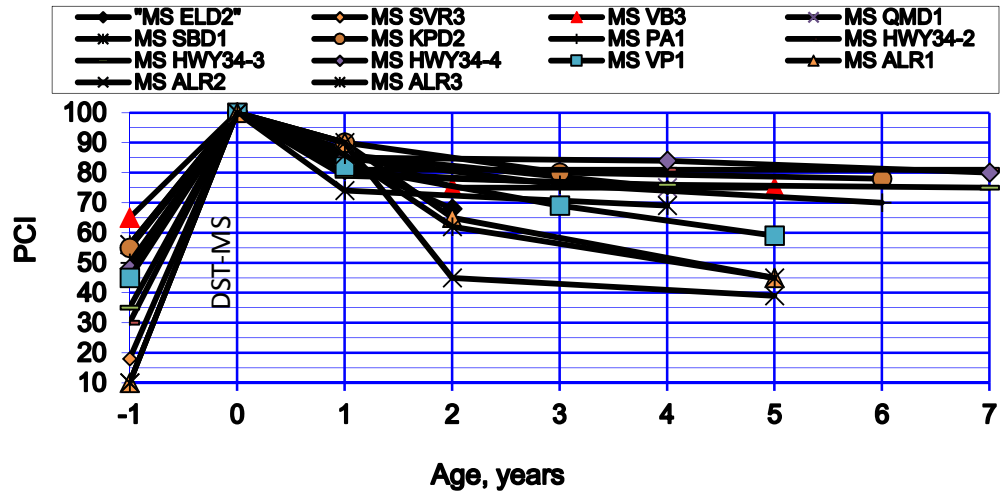


Figure 17. Performance of micro-surfacing cape seals on pavements with varying pre-PCI.

Figure 18 compares the performance of several slurry seal cape seal sections on multiple roadways with pre-PCI values ranging from 85 to 100. After 5 – 7 years of service the final PCI values ranged from 65 to 92 and after 13 years of service the final PCI values ranged from 50 – 55. The data in Figure 18 indicate that the long-term performance of the slurry seal cape seals are highly variable even-though when applied on pavement sections with good conditions having PCI values above 85.

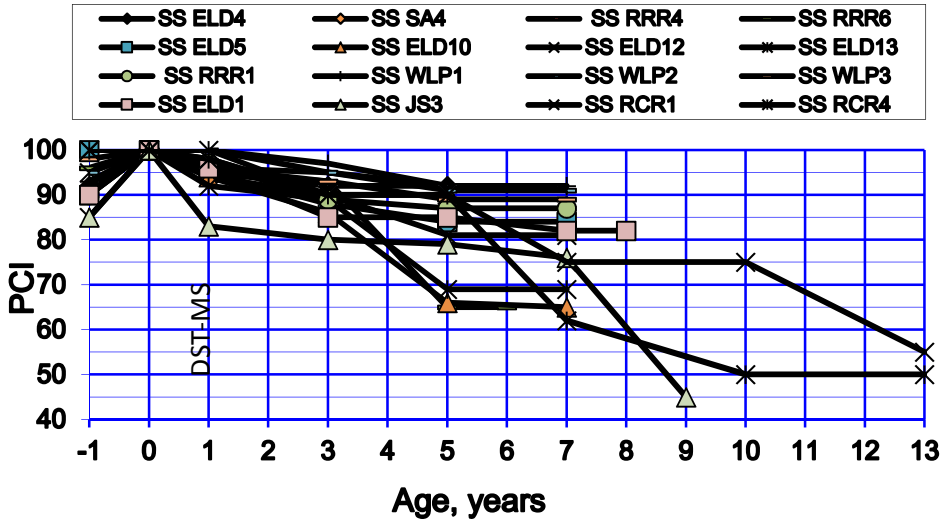


Figure 18. Performance of slurry seal cape seals on pavements with varying pre-PCI.

Task 4: Field Review of Selected Projects

In January 2016, the research team conducted field reviews of a total of 10 cape seals projects: 4 projects in the Truckee Meadows and 6 projects in Incline Village. All 10 projects were original cape seals that have not been covered by another treatment. Table 5 summarizes the information on the 10 cape seals projects. Total of 8 out of 10 projects are micro-surfacing cape seals. Three of the micro-surfacing cape seals were constructed in 2015. The 2015 projects were not included in the evaluations conducted under this research project, and therefore, the corresponding Pre-PCI values are not available.

Figures 19 - 28 shows the 2016 conditions of the cape seals projects. Each figure presents the overall condition of the section and a close-up view of the surface texture. A review of the sections conditions reveals the following observations:

- The micro-surfacing cape seals sections on Alexander Lake Rd. is showing excellent performance after 9 years of service. Even-though the Pre-PCI value was very low at 34 the micro-surfacing cape seals held-up very well with minimal amount of cracking and raveling.

- The micro-surfacing cape seals sections on Quiet Meadows Dr. and Saddlebow Dr. are showing very poor performance after 6 years of service which is mainly caused by reflective cracking of the block and fatigue cracking of the asphalt concrete layer. The surface texture of both sections still looks very good with minimum raveling. It is believed that these two roads may have been structural damaged due to the heavy construction vehicles during the early part of their service lives.
- The 1-year old micro-surfacing cape seal on Callahan Road is already showing reflective transverse cracking at several locations. However, the surface texture is excellent throughout the entire section. Even-though Washoe County records show that the cracks were sealed prior to the application of the cape seal, a good number of the cracks reflected through.
- The micro-surfacing cape seals sections on Sky Way and Panderosa Blvd. are showing fair performance after 8 and 7 years of service, respectively. The sections are showing reflective cracking of the block and thermal cracks of the asphalt concrete layer. The surface texture of both sections still looks very good with minimum raveling.
- The 1-year old micro-surfacing cape seals on Joyce Lane and Tyner Way are already showing reflective transverse cracking at several locations. However, the surface texture is excellent throughout the entire section. It is believed that the reflective cracking is caused by the lack of crack sealing of the existing thermal cracks in the asphalt concrete layer.
- The sections on Fairview Blvd. and Jennifer St. are the only slurry seal cape seals that are still uncovered by other treatments. Both sections are 14 years old. Both sections are showing significant amounts of reflective cracking. The surface texture on Fairview shows medium severity raveling while the surface texture on Jennifer shows severe raveling where the slurry is almost completely gone.

Table 5. Information on the 11 Cape Seals Projects reviewed in 2016.

Project	Section	Cape Seal Type	Pre-PCI	Construction Year/Age (yr)
Truck Meadows				
Alexander Lake Rd.	2	Micro-surfacing	34	2006/9
Quiet Meadows Dr.	1	Micro-surfacing	56	2009/6
Saddlebow Dr.	1	Micro-surfacing	56	2009/6
Callahan Rd.	4	Micro-surfacing		2015/1
Incline Village				
Sky Way	1	Micro-surfacing	83	2008/8
Ponderosa Blvd.	1	Micro-surfacing	56	2007/7
Joyce Lane	1	Micro-surfacing		2015/1
Tyner Way	2	Micro-surfacing		2015/1
Fairview Blvd.	2	Slurry Seal	71	2001/14
Jennifer St.	3	Slurry Seal	89	2001/14

Figure 19. 2016 Overall Condition and Surface Texture of Alexander Lake Rd.

Figure 20. 2016 Overall Condition and Surface Texture of Quiet Meadows Dr.

Figure 21. 2016 Overall Condition and Surface Texture of Saddlebow Dr.

Figure 22. 2016 Overall Condition and Surface Texture of Callahan Rd.

Figure 23. 2016 Overall Condition and Surface Texture of Sky Way.

Figure 24. 2016 Overall Condition and Surface Texture of Ponderosa Blvd.


Figure 25. 2016 Overall Condition and Surface Texture of Joyce Lane.


Figure 26. 2016 Overall Condition and Surface Texture of Tyner Way.


Figure 27. 2016 Overall Condition and Surface Texture of Fairview Blvd.

Figure 28. 2016 Overall Condition and Surface Texture of Jennifer St.

COMPARISON BASED ON OVERALL LONG-TERM PERFORMANCE

The objective of this analysis is to compare the overall long-term performance of cape seals constructed with micro-surfacing and slurry seal. The cape seals sections at 7 years of service provided the most basis for comparisons. Figure 29 shows the long-term performance in terms of the PCI values of micro-surfacing and slurry seal cape seals that have constructed by Washoe County during the past 15 years. The comparison included 10 micro-surfacing cape seal sections and 10 slurry seal cape seal sections.

A review of the performance data presented in Figure 29 leads to the following observations:

- Micro-surfacing cape seals have been applied over pavements with a wide range of conditions; pre-PCI values from 30 to 100.
- Slurry seal cape seals have been applied over pavements with a narrow range of conditions; pre-PCI values from 85 to 100.
- Micro-surfacing cape seals exhibit very consistent long-term performance regardless of the conditions of the existing pavement as expressed by the pre-PCI level. This is shown by the narrow range of the final PCI values of 70 – 80.
- Slurry seal cape seals exhibit a highly variable long-term performance even-though the conditions of the existing pavement are mainly good as expressed by the high pre-PCI levels (over 85). This is shown by the wide range of the final PCI values of 62 – 92.

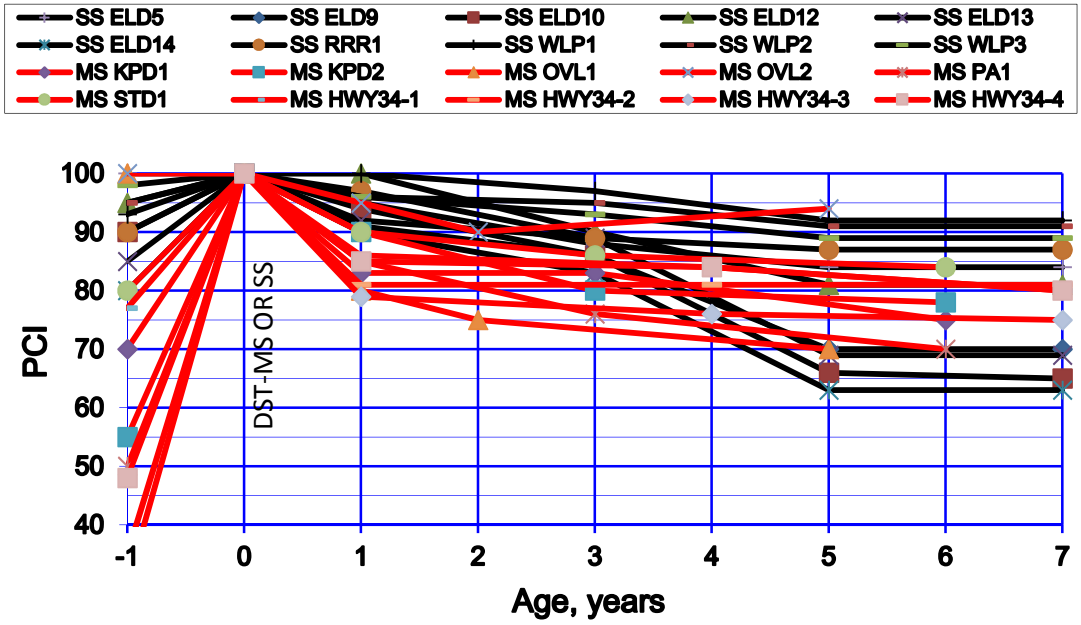


Figure 29. Performance of micro-surfacing and slurry seal cape seals on multiple pavements.

COMPARISON BASED ON LIFE CYCLE COST ANALYSIS

This part of the evaluation conducted life cycle cost analysis (LCCA) of cape seals with micro-surfacing and slurry seal. The LCCA is based on two major components: unit cost and performance life of each type of cape seal.

Cost of Cape Seals

Washoe County solicits bids for its annual pavement infrastructure preservation program utilizing separate pay items for chip seal, slurry seal, and micro-surfacing. The bid schedule was obtained for the 2015/2016 and the 2007/2008 programs. In the 2015/2016 bid the unit prices for a chip seal, type II slurry seal, and micro-surfacing were $145, $160, and $169 per ton, respectively. The unit bid prices received in the 2007/2008 solicitation for a chip seal, type II slurry seal, and micro-surfacing were $175, $165, and $190 per ton, respectively. In reviewing the approximate quantities bid each year the 2007/2008 quantities were more balanced than the quantities in the year 2015/2016 (i.e. included similar tonnage for each treatment). Also the difference in cost of the slurry seal and micro-surfacing bid of 2007/2008 were slightly larger at $25 per ton as compared to the difference of only $9 for the 2015/2016 program. Based on these observations, the cost data for the 2007/2008 were selected for the LCCA.

The next step was to convert the cost based on bid item of tonnage to a cost per square yard for each type of cape seal. Using the general recommended application rates for chip seals, slurry seals, and micro-surfacing, the costs per ton were converted to costs per square yard as summarized in Table 6. The cost data show that the micro-surfacing cape seals are 27% more expensive than the slurry seal cape seals. The LCCA combines the unit costs of the cape seals with their corresponding performance life in order to identify the more effective type.

Table 6: Unit Costs of Cape Seals used in the LCCA.

Treatment	Bid Price ($/ton)	Application Rate Truckee Meadows (lb/yd^2)	Application Rate Incline Village (lb/yd^2)	Application Unit Cost ($/lb)	Treatment Cost ($/yd^2)	
					Truckee Meadows	Incline Village
3/8" Chip Seal	175	25	25	0.0875	2.18	2.18
Type II Slurry Seal	165	16	18	0.0825	1.32	1.49
Micro-surfacing	190	24	28	0.095	2.28	2.66
Type II Slurry Seal Cape Seal					3.50	3.67
Micro-surfacing Cape Seal					4.46	4.84

Performance Life of Cape Seals

The various analyses conducted in this study showed that the most critical factor on the long-term performance of cape seals is the pre-PCI value (PCI of the pavement prior to the application of the cape seal). Based on these observations, it was decided to define the effective performance life of a cape seal as the number of years in-service after the application of the cape seal until the pavement section reaches its pre-PCI value. For example, if a micro-surfacing cape seal is applied over a pavement section with a PCI of 70 and the performance data indicate that the pavement returned to a PCI level of 70 after 5 years in-service, in this case the effective performance life of the micro-surfacing cape seal is 5 years. It should be noted that no slurry seal cape seals were applied to pavement sections with pre-PCIs below 65 which may limit the determination of the effective performance life of the slurry seal cape seals.

Figure 30 shows the performance of micro-surfacing cape seals in the Truckee Meadows. The average pre-PCI value for the 11 micro-surfacing cape seals is 42. Based on the general trends of the performance curves, it appears that the extrapolated number of in-service years for the pavement to reach a PCI of 42 would be approximately 7 years. Therefore, the effective performance life of micro-surfacing cape seals in the Truckee Meadows is 7 years.

Figure 31 shows the performance of slurry seal cape seals in the Truckee Meadows. The average pre-PCI value for the 16 slurry seal cape seals is 90. Based on the general trends of the

performance curves, it appears that the number of in-service years for the pavement to reach a PCI of 90 would be approximately 3.5 years. Therefore, the effective performance life of slurry seal cape seals in the Truckee Meadows is 3.5 years.

Figure 32 shows the performance of micro-surfacing cape seals in Incline Village. The average pre-PCI value for the 18 micro-surfacing cape seals is 80. Based on the general trends of the performance curves, it appears that the number of in-service years for the pavement to reach a PCI of 80 would be approximately 5 years. Therefore, the effective performance life of micro-surfacing cape seals in Incline Village is 5 years. Prior to the application of cape seals, the performance life of slurry seals and micro-surfacing in Incline Village ranged from 1 to 3 years.

Figure 33 shows the performance of slurry seal cape seals in Incline Village. The average pre-PCI value for the 3 slurry seal cape seals is 74. Based on the general trends of the performance curves, it appears that the number of in-service years for the pavement to reach a PCI of 74 would be approximately 3.5 years. Therefore, the effective performance life of slurry seal cape seals in Incline Village is 3.5 years.

Benefit Cost Ratio

The last step of the LCCA is to calculate the benefit cost ratio of the two types of cape seals. The benefit cost ratio is defined as the ratio of the benefit provided by the cape seal treatment over its unit cost. The benefit in this case is represented by the effective performance life of the cape seal. The unit of the benefit ratio is year per dollar (yr/$) of effective performance life. Therefore, the higher the benefit cost ratio the more economical and effective the cape seal. In other words, a higher benefit cost ratio indicates that more years of effective performance life is achieved per 1-dollar of cost. Table 7 summarizes the benefit cost ratios of the two types of cape seals.

Table 7: Benefit Cost Ratios of Micro-surfacing and Slurry Seal Cape Seals.

Location	Cape Seal	Effective Performance Life (yrs)	Unit Cost ($/yd^2)	Benefit Cost Ratio (yr/$)
Truckee Meadows	Micro-surfacing	7.0	4.46	1.57
	Slurry Seal	3.5	3.50	1.00
Incline Village	Micro-surfacing	5.0	4.84	1.03
	Slurry Seal	3.0	3.67	0.82

The LCCA indicates that the micro-surfacing cape seal is more cost effective than the slurry seal cape seal at both locations of Truckee Meadows and Incline Village. In the Truckee Meadows the micro-surfacing cape seal achieved 57% higher benefit cost ratio than the slurry seal cape seal. In Incline Village the micro-surfacing cape seal achieved 20% higher benefit cost ratio than the slurry seal cape seal. It should be noted that the benefit cost ratio of the slurry seal cape seals in Incline Village should be observed with caution due to the limited number of pavement sections of 3. The benefit cost ratios of both types of cape seals in Incline Village are lower than

their benefit cost ratios in the Truckee Meadows. This finding is expected due to the additional snowplow and chains damages encountered in Incline Village.

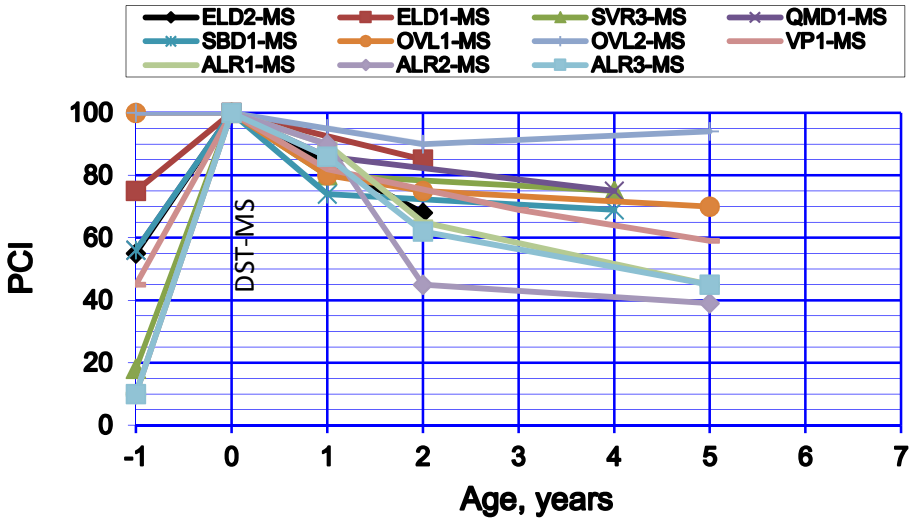


Figure 30. Overall performance of micro-surfacing cape seals in the Truckee Meadows.

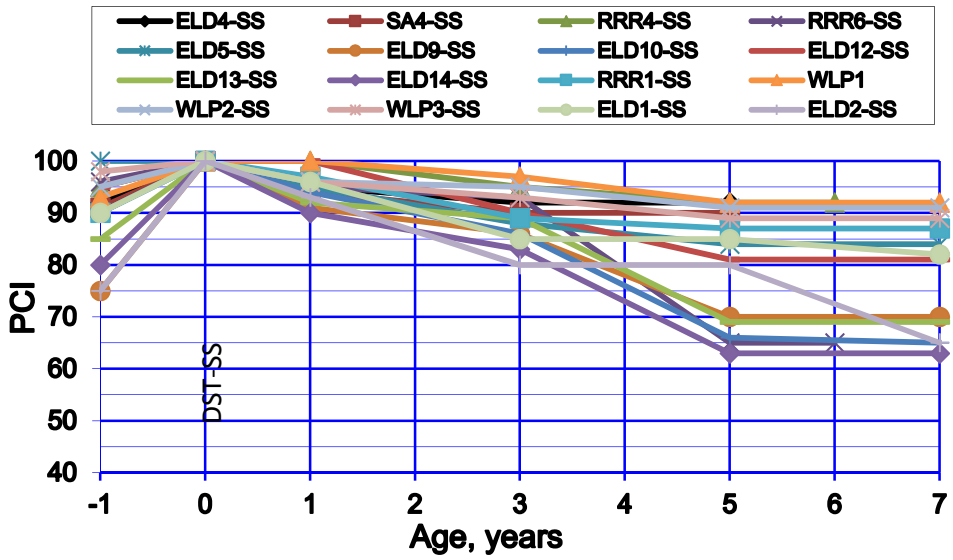


Figure 31. Overall performance of slurry seal cape seals in the Truckee Meadows.

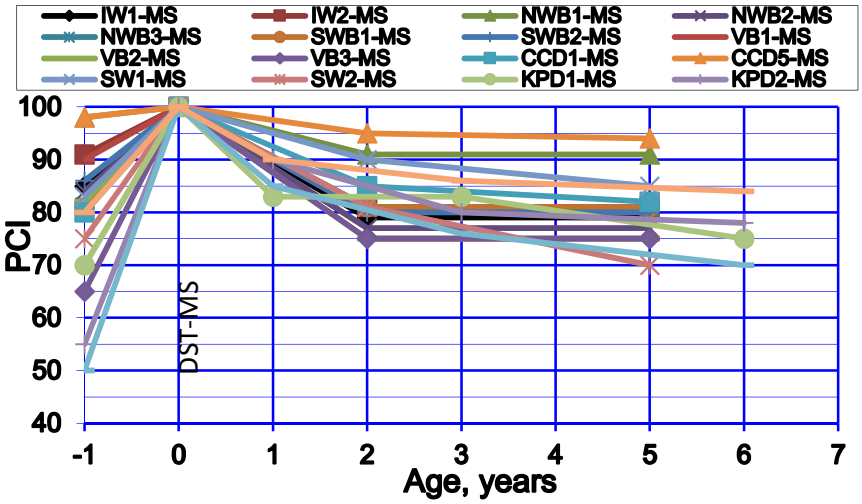


Figure 32. Overall performance of micro-surfacing cape seals in Incline Village.

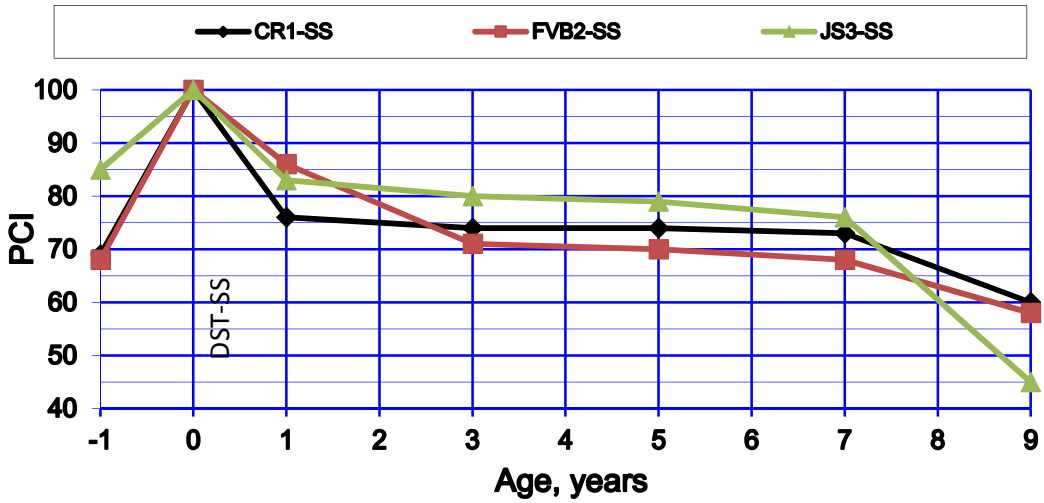


Figure 33. Overall performance of slurry seal cape seals in Incline Village.

FINDINGS AND RECOMMENDATIONS

This research project evaluated the long-term performance of cape seals with micro-surfacing and slurry seal in the Truckee Meadows and Incline Village areas of Northern Nevada. A total of 55 cape seal sections were evaluated; 33 micro-surfacing and 22 slurry seal. The ages of the evaluated sections range from 4 to 13 years. The impact of the following factors on the long-term performance of the cape seals were evaluated:

- Construction Practices
- Materials Properties and Mix Design
- Traffic Level
- Pavement Structure
- Environment/Climate
- Pre-PCI (PCI prior to application of cape seal)

In addition to the analysis of the field performance data in terms of the PCI values, a field review of selected projects and a life cycle cost analysis were completed. The analysis of the data generated from this research led to the following findings:

- Information available on the mix designs and QA testing of aggregates and emulsions on the evaluated cape seals were not complete.
- Among the six factors that were evaluated, only the pre-PCI value had a significant impact on the long-term performance of the cape seals.
- Micro-surfacing cape seals exhibit very consistent long-term performance regardless of the conditions of the existing pavement as expressed by the pre-PCI level. This is shown by the narrow range of the final PCI values of all micro-surfacing cape seals of 70 – 80.
- Slurry seal cape seals exhibit a highly variable long-term performance even-though the conditions of the existing pavement are mainly good as expressed by the high pre-PCI levels (over 85). This is shown by the wide range of the final PCI values of all the slurry seal cape seals of 62 – 92.
- Even-though the pre-PCI showed the most significant impact on the long-term performance of the cape seal, some projects with lower pre-PCI out-performed projects with higher pre-PCI. This indicates that the exact level of the pre-PCI is not the only critical value but the type of distresses that led to the drop in the PCI is also critical. For example, if the same level of the pre-PCI on one project is mainly due to raveling and bleeding while on another project is due to cracking, the project experiencing the cracking distresses in the existing pavement will have a reduced performance life due to the extensive appearance of reflective cracking.
- The effective performance life of micro-surfacing cape seals is 7 years in the Truckee Meadows and 5 years in Incline Village.
- The effective performance life of slurry seal cape seals is 3.5 years in the Truckee Meadows and 3 years in Incline Village.
- The LCCA indicates that the micro-surfacing cape seal is more cost effective than the slurry seal cape seal at both locations of Truckee Meadows and Incline Village. In the Truckee Meadows the micro-surfacing cape seal achieved 57% higher benefit cost ratio than the slurry seal cape seal. In Incline Village the micro-surfacing cape seal achieved 30% higher benefit cost ratio than the slurry seal cape seal.

Based on the results and findings of this research effort, the following recommendations are made:

- Based on the excellent long-term performance and the significantly higher benefit cost ratio of the micro-surfacing cape seals as compared to the slurry seal cape seals, road agencies should continue to use the micro-surfacing cape seal as a preventive maintenance treatment.
- Road agencies are encouraged to conduct full mix designs and implement an effective QA testing program for the cape seal projects.
- Road agencies should implement an effective crack sealing program prior to the application of the cape seal treatment.
- Even-though the pre-PCI showed the most significant impact on the long-term performance of cape seals, road agencies should further investigate the various individual distresses on the existing pavement prior to making the decision regarding the application of the cape seal treatment.

ACKNOWLEDGEMENT

The research team would like to acknowledge the excellent support of Washoe County Community Services Department for providing all the necessary construction records and performance data.

APPENDIX A: SECTIONS SUMMARY

Network	Branch	Section	Seal Type	Covered	Year	Combined	Name	From	To	Length	Width	True Area	Rank	Age
TM3	L3031	1	M Type 3		2010	q	EASTLAKE BOULEVARD	CATTLEGUARD @ THE N. END	1750 FT. SO. CATTLEGUARD	1,745	24	41,880	A	4
TM3	L3031	2	M Type 3		2010	q	EASTLAKE BOULEVARD	1750 FT. SO. CATTLEGUARD	4144 FT. SO. CATTLEGUARD	2,394	24	57,456	A	4
TM7	L7281	3	M Type 3		2010		SOUTH VERDI ROAD	995' E. OF BRIDGE ST.	25' E. OF GARSON RD.	6,142	20	122,840	B	4
INV	I0109	5	M Type 3	Y	2008	ff	COUNTRY CLUB DRIVE	109' N. OF VILLAGE BLVD.	SOUTH SIDE S.R. 431	3942	30	118483	B	5
INV	I0122	1	M Type 3	Y	2008	gg	INCLINE WAY	NORTH SIDE COUNTRY CLUB	S. SIDE SOUTHWOOD BLVD.	3157	25	80459	B	5
INV	I0122	2	M Type 3	Y	2008	gg	INCLINE WAY	NO. SIDE SOUTHWOOD BLVD.	EAST SIDE VILLAGE BLVD.	1354	24	33354	B	5
INV	I0201	1	M Type 3	Y	2008	hh	NORTHWOOD BOULEVARD	N. SIDE OF S.R. 28-W.INT.	20' N.E. WILLOW CT.	1048	28	30462	B	5
INV	I0201	2	M Type 3	Y	2008	hh	NORTHWOOD BOULEVARD	20' N.E. WILLOW CT.	W. SIDE VILLAGE BOULEVARD	2259	25	57651	B	5
INV	I0201	3	M Type 3	Y	2008	hh	NORTHWOOD BOULEVARD	EAST SIDE VILLAGE BLVD.	135' N. OF S.R. 28-E.INT.	3173	25	83641	B	5
TM6	L6384	1	M Type 3		2009		QUIET MEADOW DRIVE (NORTH)	E. OF THOMAS CREEK RD.	S. SIDE OF CABALLERO CT.	2,126	33	71,626	C	5
TM6	L6359	1	M Type 3		2009		SADDLEBOW DRIVE(AND WEST)	N.W. OF SADDLEHORN(E.INT)	542' SO. OF POWDER RIVER	3,034	33	100,501	C	5
INV	I0202	1	M Type 3	Y	2008	ii	SOUTHWOOD BOULEVARD	52' S. OF S.R. 28-E. INT.	EAST SIDE VILLAGE BLVD.	1779	25	46468	B	5
INV	I0202	2	M Type 3	Y	2008	ii	SOUTHWOOD BOULEVARD	WEST SIDE VILLAGE BLVD.	112' SO. S.R. 28 (W.INT.)	3864	27	111170	B	5
INV	I0087	1	M Type 3	Y	2008	jj	VILLAGE BOULEVARD	N. SIDE LAKESHORE BLVD.	283' S. OF SOUTHWOOD BLVD	1798	29	54878	B	5
INV	I0087	2	M Type 3	Y	2008	jj	VILLAGE BOULEVARD	283' S. OF SOUTHWOOD BLVD	116' S. OF TANAGER ST.	1123	29	32567	B	5
INV	I0087	3	M Type 3	Y	2008	jj	VILLAGE BOULEVARD	116 S. OF TANAGER ST.	SOUTH SIDE TAHOE BLVD.	562	35	20909	B	5
TM3	L3031	4	SType 2	Y	2000	aa	EASTLAKE BOULEVARD	68 FT. NO. COTTONTAIL LN.	505 FT. SO. COYOTE DRIVE	2668	24	64032	A	5
TM4	L4041	4	SType 2	Y	2000		SEVENTH AVENUE	22 FT. W. SUN VALLEY DR.	S.E. OF GOLDEN VALLEY DR.	8710	25	217972	A	5
INV	I0109	1	M Type 3		2008	ff	COUNTRY CLUB DRIVE	NORTH SIDE LAKESHORE BLVD	WEST SIDE TAHOE BLVD.	2785	29	82789	B	6
INV	I0198	1	M Type 3		2008	i	SKI WAY	EAST SIDE COUNTRY CLUB DR	164' SO. OF FAIRVIEW DR.	4,282	30	137,771	C	6
INV	I0198	2	M Type 3		2008	i	SKI WAY	164' SO. OF FAIRVIEW ET.	S.SIDE FAIRVIEW-INT.	164	43	7,052	C	6
TM2	L2200	4	SType 2	Y	2000	bb	RED ROCK ROAD	91'S.SILVER KNOLLS PIT RD	460 FT. N. OF ADOBE DR.	5973	24	143352	A	6
TM2	L2200	6	SType 2	Y	2000	bb	RED ROCK ROAD	628' N. ANTELOPE VALLEY	165' S. OF ARGOSY RD.	14210	24	341040	A	6
GRL	G0017	1	M Type 3		2007	a	HIGHWAY 34	1152' N.W. OF ELM ST.	1994' N.W. OF ELM ST.	842	25	21,050	E	7
GRL	G0017	2	M Type 3		2007	a	HIGHWAY 34	1994' N.W. OF ELM ST.	8352' N.W. OF ELM ST.	6,358	25	158,950	E	7
GRL	G0017	3	M Type 3		2007	a	HIGHWAY 34	8352' N.W. OF ELM ST.	7256' N. BLM LAKEBED SIGN	17,032	24	408,768	E	7
GRL	G0017	4	M Type 3		2007	a	HIGHWAY 34	7256' N. BLM LAKEBED SIGN	2629' N.E. OF COUNTY LINE	11,427	25	285,675	E	7
INV	I0203	1	M Type 3		2007	j	KNOTTY PINE DRIVE	S.W. TIP OF DALE DRIVE	95' S. OF SUGAR PINE	533	25	13,625	C	7
INV	I0203	2	M Type 3		2007	j	KNOTTY PINE DRIVE	95' S. OF SUGAR PINE	WEST SIDE 2ND CREEK DRIVE	3,751	25	96,575	C	7
TM2	L2237	1	M Type 3		2007	p	OVERLAND ROAD	N.E. OF OREGON BLVD.	W. SIDE OF IDAHO ST.	2,154	25	54,885	C	7

Network	Branch	Section	Seal Type	Covered	Year	Combined	Name	From	To	Length	Width	True Area	Rank	Age
TM2	L2237	2	M Type 3		2007	p	OVERLAND ROAD	E. SIDE OF IDAHO ST.	W. OF MATTERHORN BLVD.	1,963	25	49,908	C	7
INV	I0124	1	M Type 3		2007		PONDEROSA AVENUE	N. SIDE TAHOE BOULEVARD	N. TIP RED CEDAR ROAD	4,074	25	102,212	C	7
INV	I0210	1	M Type 3		2007		SILVERTIP DRIVE	N. SIDE PONDEROSA-W.INT.	N. SIDE PONDEROSA-E.INT.	3,003	24	72,843	C	7
TM3	L3031	5	SType 2	y	2000	aa	EASTLAKE BOULEVARD	505 FT. SO. COYOTE DRIVE	60' SO. OF PERSHING LANE	1,571.00	25	39,275.00	A	7
TM3	L3031	9	SType 2	Y	2000	cc	EASTLAKE BOULEVARD	100' S. OF 5375 EASTLAKE	778' E. MAIN PARK ACCESS	4683	23	107709	A	7
TM3	L3031	10	SType 2	Y	2000	cc	EASTLAKE BOULEVARD	778' E. MAIN PARK ACCESS	65' E. OF S. BEACH ACCESS	7712	24	185088	A	7
TM3	L3031	11	SType 2	Y	2000	cc	EASTLAKE BOULEVARD	65' E. OF S. BEACH ACCESS	2500' W. OF S. BEACH ACC.	2588	23	59524	A	7
TM3	L3031	12	SType 2	Y	2000	cc	EASTLAKE BOULEVARD	2500' W. OF S. BEACH ACC.	4407' E. OF DUCK HILL RD.	2145	23	49335	A	7
TM3	L3031	13	SType 2	Y	2000	cc	EASTLAKE BOULEVARD	4407' E. OF DUCK HILL RD.	800' E. OF DUCK HILL RD.	3607	23	82961	A	7
TM3	L3031	14	SType 2	Y	2000	cc	EASTLAKE BOULEVARD	800' E. OF DUCK HILL RD.	747' W. OF DUCK HILL RD.	1569	25	39225	A	7
TM2	L2200	1	SType 2	Y	2000	bb	RED ROCK ROAD	210 FT. N. OF MOYA BLVD.	104 FT. W. OF OSAG ROAD	8745	24	209880	A	7
TM2	L2049	1	SType 2	Y	2000	dd	WHITE LAKE PARKWAY	5' S.W. MILE MARKER 427	2242' N. MILE MAKER 427	2228	37	82436	A	7
TM2	L2049	2	SType 2	Y	2000	dd	WHITE LAKE PARKWAY	2242' N. MILE MAKER 427	937'S. CYRSTAL CANYON BL.	4803	41	196923	A	7
TM2	L2049	3	SType 2	Y	2000	dd	WHITE LAKE PARKWAY	937'S. CRYSTAL CANYON BL.	14 FT. S.E. BRANT STREET	2872	36	108642	A	7
TM1	L1113	1	M Type 3		2006	n	ALEXANDER LAKE ROAD	SO. SIDE OF McCARRAN BLVD	W. SIDE 1ST CATTLE GUARD	6,203	28	175,313	D	8
TM1	L1113	2	M Type 3		2006	n	ALEXANDER LAKE ROAD	E. SIDE 1ST CATTLE GUARD	S. SIDE 2ND CATTLE GUARD	5,893	28	165,004	D	8
TM1	L1113	3	M Type 3		2006	n	ALEXANDER LAKE ROAD	N. SIDE 2ND CATTLE GUARD	W. SIDE 3RD CATTLE GUARD	4,382	28	122,696	D	8
TM2	L2366	1	M Type 3		2006		VILLAGE PARKWAY	65 NE OF COLD SPRINGS DR.	550' SW OF DIAMOND PEAK	3,830	31	118,730	A	8
TM3	L3031	1	SType 2	Y	2002	ee	EASTLAKE BOULEVARD	CATTLEGUARD @ THE N. END	1750 FT. SO. CATTLEGUARD	1745	24	41880	A	8
TM3	L3031	2	SType 2	Y	2002	ee	EASTLAKE BOULEVARD	1750 FT. SO. CATTLEGUARD	4144 FT. SO. CATTLEGUARD	2394	24	57456	A	8
INV	I0199	2	SType 2		2001		FAIRVIEW BOULEVARD	225' E. OF CHAMPAGNE RD.	N. SIDE OF CRISTINA DR.	6,223	23	143,129	C	13
INV	I0218	3	SType 2		2001		JENNIFER STREET	25' S. OF CARSON COURT	958' NO OF BIDWELL COURT	3,536	35	126,078	C	13
INV	I0039	1	SType 3	Y	2001		CHAMPAGNE ROAD	SO. SIDE FAIRVIEW BLVD.	1778' S. OF FAIRVIEW BLVD	1778	24	43075	C	13
GRL	G0019	1	SType 3	Y	2001		RODEO CREEK ROAD	E. OF SR 447	3.281 MILES E. OF SR 447	17323	25	433075	D	13
GRL	G0019	4	SType 3		2001		RODEO CREEK ROAD	1.1 MILES E. EMPIRE FARM	EMPIRE FARM CATTLE GUARD	5,510	24	132,240	D	13

APPENDIX B: WORK HISTORY REPORTS

EAST LAKE BOULEVARD SECTION 1

1/21/2015

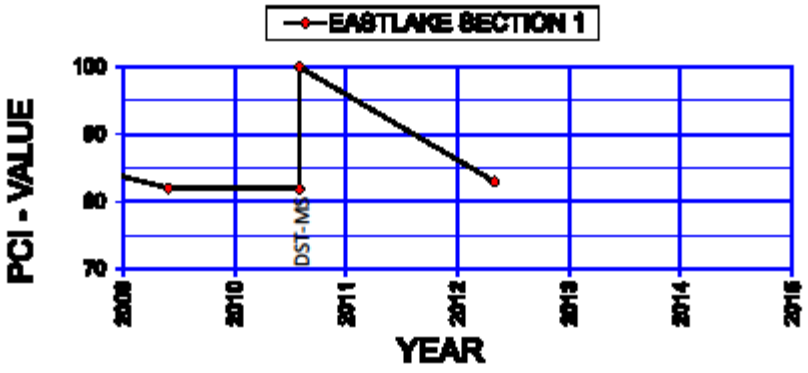
Work History Report

Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 001 **Surface:** STDMicr
L.C.D.: 7/30/1999 **Use:** ROADWA **Rank:** A **Length:** 1,745.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 41,880.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/8/2010	ST-DM	Surface Treatment Double - Micro Surfacing	0.00	0.60		2010 RTC
6/12/2002	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	02/03 SLURRY SEAL PROGRAM
7/30/1999	OL-AS	Overlay - AC Structural		3.00	☑	98/99 OVERLAY PROGRAM
7/30/1999	FA-PL	Fabric Placement		0.10	☐	98/99 OVERLAY PROGRAM
7/30/1987	OL-AS	Overlay - AC Structural	19,123.00	2.50	☑	87/88 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	1	
Traffic Class	A - ARTERIAL	
PCI-before/Date	82	5-20-2009
Treatment/Year	DCS-MS	7-8-2010
PCI-final/service year	83	2
Age	4	
Asphalt Concrete Layer	Total: 5.50" 1999: 3.00" 1987: 2.50"	



EAST LAKE BOULEVARD SECTION 2

1/21/2015 **Work History Report**

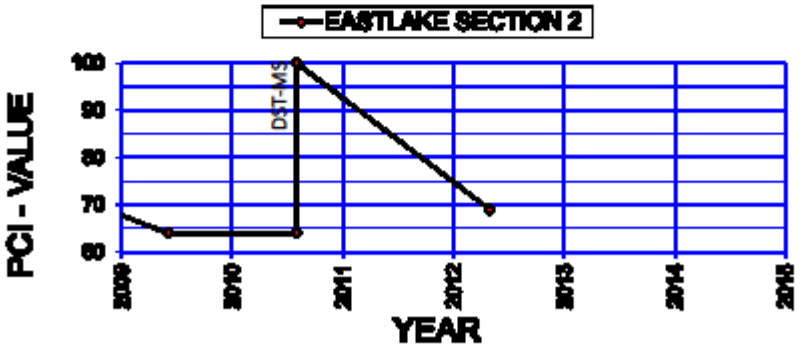
Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 002 **Surface:** STDMicr

L.C.D.: 10/1/1990 **Use:** ROADWA **Rank:** A **Length:** 2,394.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 57,456.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/8/2010	ST-DM	Surface Treatment Double - Micro Surfacing	0.00	0.60	☐	2010 RTC
6/12/2002	ST-CS	Surface Treatment Double - Cape Seal		0.50		02/03 SLURRY SEAL PROGRAM
10/1/1990	OL-AS	Overlay - AC Structural	24,100.00	2.50	✔	90/91 OVERLAY PROGRAM
4/13/1981	OL-AS	Overlay - AC Structural	23,438.00	2.50	✔	80/81 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	2	
Traffic Class	A - ARTERIAL	
PCI-before/Date	64	5-20-2009
Treatment/Year	DCS-MS	7-8-2010
PCI-final/service year	69	2
Age	4	
Asphalt Concrete Layer	Total: 5.00" 1990: 2.50" 1981: 2.50"	



SOUTH VERDI ROAD SECTION 3

1/22/2015

Work History Report

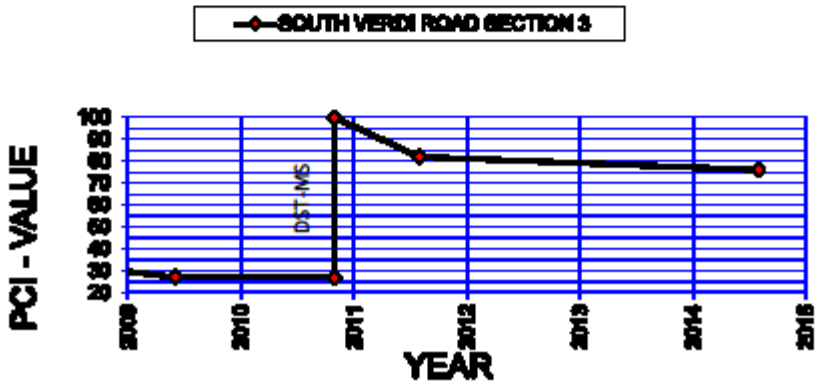
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** L7281 SOUTH VERDI R **Section:** 3 **Surface:** STDMicr

L.C.D.: 7/19/1983 **Use:** ROADWA **Rank:** B **Length:** 6,142.00 (Ft) **Width:** 20.00 (Ft) **True Area:** 122,840.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
10/11/2010	ST-DM	Surface Treatment Double - Micro Surfacing	0.00	0.60	☐	2010 RTC
5/15/2002	ST-SS	Surface Treatment - Slurry Seal	0.00	0.38	☐	CONTRACTOR
9/27/1996	ST-SS	Surface Treatment - Slurry Seal	3,336.00	0.38	☐	
7/19/1983	OL-AS	Overlay - AC Structural	14,800.00	2.50	☑	82/83 OVERLAY PROGRAM
7/1/1969	NC-AC	New Construction - AC	0.00	2.50	☑	NEW CONSTRUCTION

Roadway	South Verdi Road	
Section	3	
Traffic Class	B- COLLECTOR	
PCI-before/Date	27	5-5-2009
Treatment/Year	DCS-MS	10-11-2010
PCI-final/service year	76	4
Age	4	
Asphalt Concrete Layer	Total: 5.00" 1983: 2.50" 1969: 2.50"	



COUNTRY CLUB DRIVE SECTION 5

1/21/2015

Work History Report

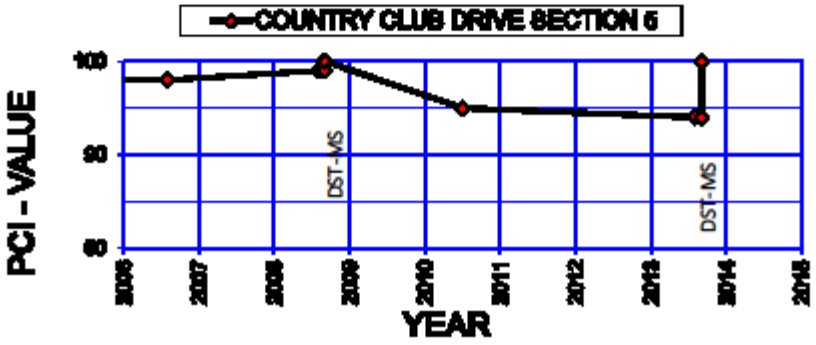
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0109 COUNTRY CLUB **Section:** 5 **Surface:** STCape

L.C.D.: 5/16/2004 **Use:** ROADWA **Rank:** B **Length:** 3,942.00 (Ft) **Width:** 30.00 (Ft) **True Area:** 118,483.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/26/2013	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50	☐	2013 RTC PREVENTIVE MAINT. PROGRAM
7/31/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50	☐	08/09 SLURRY SEAL PROGRAM
6/15/2004	ST-SS	Surface Treatment - Slurry Seal	0.00	0.40	☐	RTC 2004
5/16/2004	OL-AS	Overlay - AC Structural	0.00	3.00	☑	RTC 2004
5/15/2004	MI-CO	Cold Milling	0.00	-2.00	☐	RTC 2004
8/7/1995	ST-SS	Surface Treatment - Slurry Seal	6,045.00	0.38	☐	94/95 SLURRY SEAL PROGRAM(INC
9/26/1980	OL-AS	Overlay - AC Structural	31,647.00	2.50	☑	80/81 OVERLAY PROGRAM
5/15/1970	OL-AS	Overlay - AC Structural	0.00	3.50	☑	

Roadway	Country Club Drive	
Section	5	
Traffic Class	B - COLLECTOR	
PCI-before/Date	98	7-13-2006
Treatment/Year	DCS-MS	7-31-2008
PCI-final/service year	94	5
Age	5	
Asphalt Concrete Layer	Total: 7.00" 2004: 3.00" (mill 2.00") 1980: 2.50" 1970: 3.50	



EAST LAKE BOULEVARD SECTION 4

1/21/2015

Work History Report

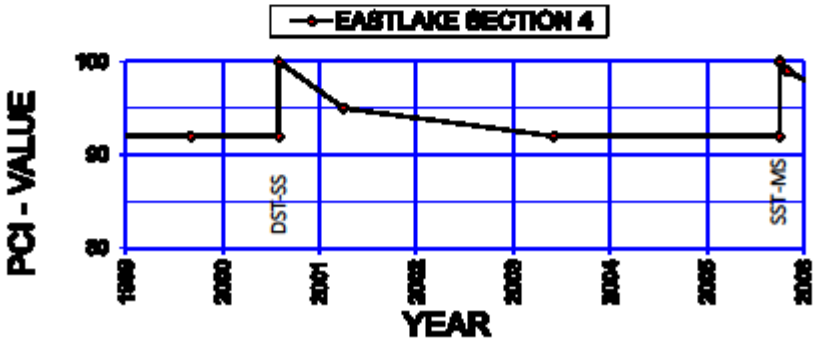
Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 004 **Surface:** STMicro

L.C.D.: 8/29/1995 **Use:** ROADWA **Rank:** A **Length:** 2,668.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 64,032.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/5/2012	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC SLURRY SEAL PROGRAM
9/13/2005	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	05/06 SLURRY SEAL PROGRAM
7/25/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	99/00 SLURRY SEAL
8/29/1995	OL-AS	Overlay - AC Structural	41,620.00	2.50	☑	94/95 OVERLAY PROGRAM
8/30/1984	OL-AS	Overlay - AC Structural	13,946.00	2.50	☑	84/85 OVERLAY PROGRAM
8/30/1980	OL-AS	Overlay - AC Structural		2.50	☑	79/80 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	4	
Traffic Class	A - ARTERIAL	
PCI-before/Date	92	8-21-1999
Treatment/Year	DCS-SS	7-25-2000
PCI-final/service year	92	3
Age	5	
Asphalt Concrete Layer	Total: 7.50" 1995: 2.50" 1984: 2.50" 1980: 2.50"	



INCLINE WAY SECTION 1

1/23/2015

Work History Report

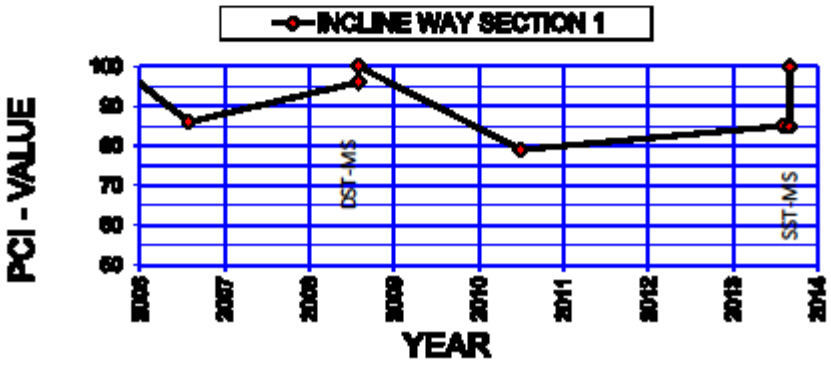
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0122 INCLINE WAY **Section:** 1 **Surface:** STMicro

L.C.D.: 8/15/1985 **Use:** ROADWA **Rank:** B **Length:** 3,157.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 80,459.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/20/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		2013 RTC PREVENTIVE MAINT. PROGRAM
7/16/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
9/1/2005	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC SLURRY SEAL PROGRAM
8/8/2002	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	02/03 SLURRY SEAL PROGRAM
9/14/1998	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	97/98 SLURRY SEAL
8/15/1985	OL-AS	Overlay - AC Structural	38,879.00	2.50	☑	84/85 OVERLAY PROGRAM
10/3/1977	OL-AS	Overlay - AC Structural	29,159.00	2.50	☑	77/78 OVERLAY PROGRAM

Roadway	Incline Way	
Section	1	
Traffic Class	B - COLLECTOR	
PCI-before/Date	96	7-10-2008
Treatment/Year	DCS-MS	7-16-2008
PCI-final/service year	85	5
Age	5	
Asphalt Concrete Layer	Total: 5.00" 1985: 2.50" 1977: 2.50"	



INCLINE WAY SECTION 2

1/23/2015

Work History Report

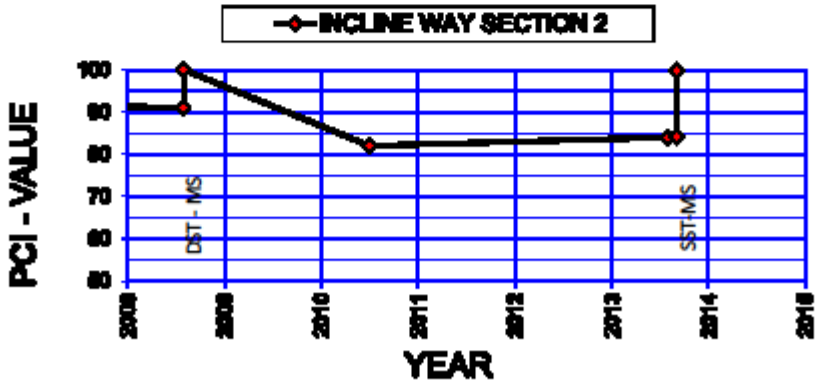
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0122 INCLINE WAY **Section:** 2 **Surface:** STMicro

L.C.D.: 8/6/1990 **Use:** ROADWA **Rank:** B **Length:** 1,354.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 33,354.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/20/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		2013 RTC PREVENTIVE MAINT. PROGRAM
7/16/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
9/1/2005	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC SLURRY SEAL PROGRAM
8/8/2002	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	02/03 SLURRY SEAL PROGRAM
9/14/1998	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	97/98 SLURRY SEAL
8/6/1990	OL-AS	Overlay - AC Structural	0.00	2.50	☑	89\90 OVERLAY PROGRAM
9/25/1979	OL-AS	Overlay - AC Structural	14,947.00	2.50	☑	79/80 OVERLAY PROGRAM

Roadway	Incline Way	
Section	2	
Traffic Class	B - COLLECTOR	
PCI-before/Date	91	7-15-2008
Treatment/Year	DCS-MS	7-16-2008
PCI-final/service year	84	5
Age	5	
Asphalt Concrete Layer	Total: 5.00" 1990: 2.50" 1979: 2.50"	



NORTHWOOD BOULEVARD SECTION 1

1/23/2015

Work History Report

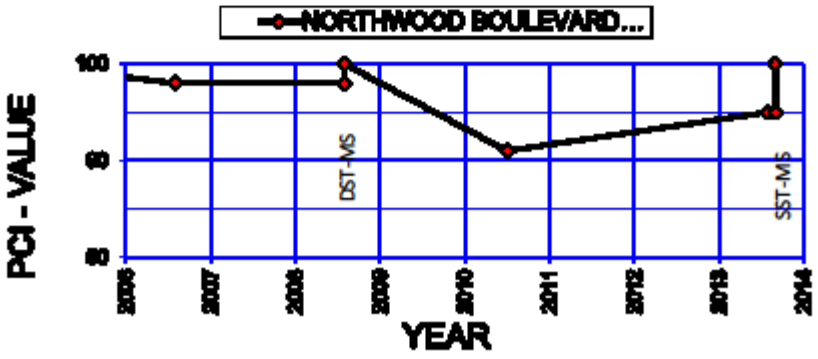
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0201 NORTHWOOD B **Section:** 1 **Surface:** STMicro

L.C.D.: 8/16/2001 **Use:** ROADWA **Rank:** B **Length:** 1,048.00 (Ft) **Width:** 28.00 (Ft) **True Area:** 30,462.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/23/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	2013 RTC PREVENTIVE MAINT. PROGRAM
7/21/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50	☐	08/09 SLURRY SEAL PROGRAM
9/7/2003	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC / RE-DONE 2004
8/16/2001	OL-AS	Overlay - AC Structural		2.50	☑	00/01 OVERLAY PROGRAM
8/15/2001	FA-PL	Fabric Placement		0.10		00/01 OVERLAY PROGRAM
8/4/1997	ST-SS	Surface Treatment - Slurry Seal		0.38		96/97 SLURRY SEAL
7/18/1988	OL-AS	Overlay - AC Structural		2.50	☑	87/88 OVERLAY PROGRAM
9/2/1974	OL-AS	Overlay - AC Structural		2.50	☑	74/75 OVERLAY PROGRAM

Roadway	Northwood Boulevard	
Section	1	
Traffic Class	B - COLLECTOR	
PCI-before/Date	98	7-15-2008
Treatment/Year	DCS-MS	7-21-2008
PCI-final/service year	95	5
Age	5	
Asphalt Concrete Layer	Total: 7.50" 2001: 2.50" 1988: 2.50" 1974: 2.50"	



NORTHWOOD BOULEVARD SECTION 2

1/23/2015

Work History Report

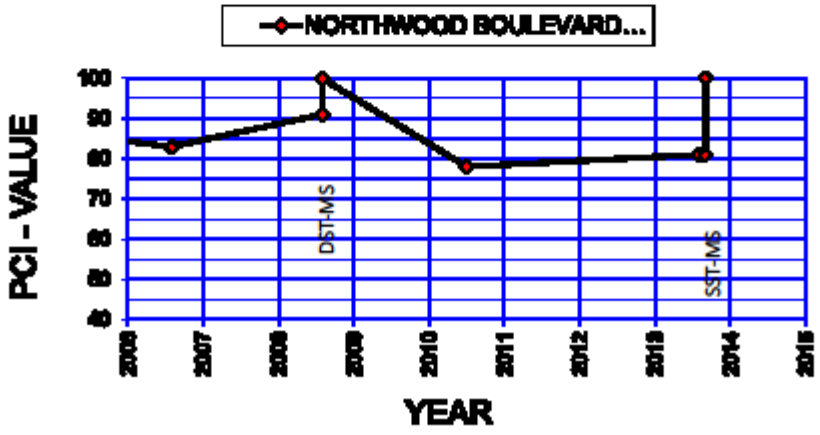
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0201 NORTHWOOD B **Section:** 2 **Surface:** STMicro

L.C.D.: 7/18/1988 **Use:** ROADWA **Rank:** B **Length:** 2,259.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 57,651.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/23/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		2013 RTC PREVENTIVE MAINT. PROGRAM
7/21/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
10/7/2003	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC / RE-DONE 2004
8/4/1997	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	96/97 SLURRY SEAL
7/18/1988	OL-AS	Overlay - AC Structural	40,316.00	2.50	☑	87/88 OVERLAY PROGRAM
9/2/1974	OL-AS	Overlay - AC Structural	25,803.00	2.50	☑	74/75 OVERLAY PROGRAM

Roadway	Northwood Boulevard	
Section	2	
Traffic Class	B - COLLECTOR	
PCI-before/Date	91	7-15-2008
Treatment/Year	DCS-MS	7-21-2008
PCI-final/service year	81	5
Age	5	
Asphalt Concrete Layer	Total: 5.00" 1988: 2.50" 1974: 2.50"	



NORTHWOOD BOULEVARD SECTION 3

1/23/2015

Work History Report

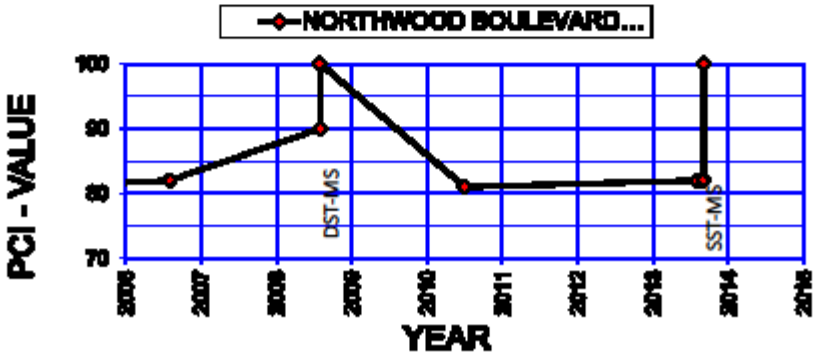
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0201 NORTHWOOD B **Section:** 3 **Surface:** STMicro

L.C.D.: 7/18/1988 **Use:** ROADWA **Rank:** B **Length:** 3,173.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 83,641.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/23/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		2013 RTC PREVENTIVE MAINT. PROGRAM
7/21/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
10/8/2003	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC / RE-DONE 2004
8/4/1997	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	96/97 SLURRY SEAL
7/18/1988	OL-AS	Overlay - AC Structural	40,664.00	2.50	☑	87/88 OVERLAY PROGRAM
11/13/1978	OL-AS	Overlay - AC Structural	1,835.00	2.50	☑	78/79 OVERLAT PROGRAM: S.R. 28
9/15/1976	OL-AS	Overlay - AC Structural	22,772.00	2.50	☑	76/77 OVERLAY PROGRAM
9/2/1974	OL-AS	Overlay - AC Structural	14,800.00	2.50	☑	74/75 OVERLAY PROGRAM: TAHOE

Roadway	Northwood Boulevard	
Section	3	
Traffic Class	B - COLLECTOR	
PCI-before/Date	90	7-15-2008
Treatment/Year	DCS-MS	7-21-2008
PCI-final/service year	82	5
Age	5	
Asphalt Concrete Layer	Total: 10.00" 1988: 2.50" 1978: 2.50" 1976: 2.50" 1974: 2.50"	



QUIET MEADOWS DRIVE SECTION 1

1/23/2015

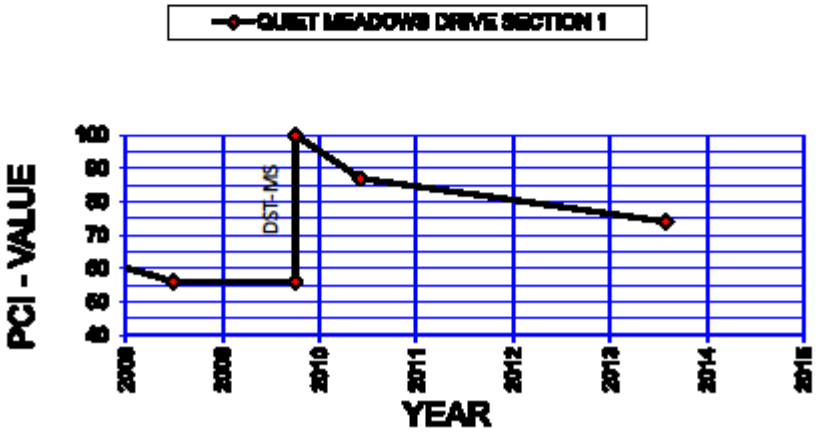
Work History Report

Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** L6384 QUIETMEADO **Section:** 1 **Surface:** STCape
L.C.D.: 9/12/1991 **Use:** ROADWA **Rank:** C **Length:** 2,126.00 (Ft) **Width:** 33.00 (Ft) **True Area:** 71,626.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
9/18/2009	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		09/10 SLURRY SEAL THRU RTC (WC FUNDS)
9/13/1991	ST-ST	Surface Treatment - Sand Tar		0.15		
9/12/1991	NC-AC	New Construction - AC		2.50	☑	NEW CONSTRUCTION

Roadway	Quiet Meadows Drive	
Section	1	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	56	6-3-2008
Treatment/Year	DCS-MS	9-18-2009
PCI-final/service year	74	4
Age	5	
Asphalt Concrete Layer	Total: 2.50" 1991: 2.50"	



SEVENTH AVENUE SECTION 4

1/23/2015

Work History Report

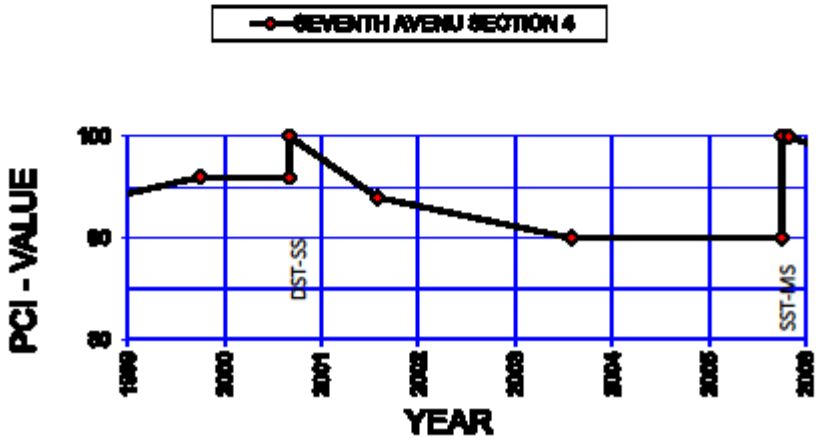
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** L4041 SEVENTH AVEN **Section:** 4 **Surface:** STMicro

L.C.D.: 7/25/1995 **Use:** ROADWA **Rank:** A **Length:** 8,710.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 217,972.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/13/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC SLURRY SEAL PROGRAM
9/26/2005	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC SLURRY SEAL PROGRAM (1/2 in 05 & 1/2 in 06)
8/24/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	99/00 SLURRY SEAL
7/25/1995	OL-AS	Overlay - AC Structural	39,733.00	3.00	☑	94/95 OVERLAY PROGRAM
7/24/1995	OL-AF	Overlay - AC Fabric	0.00	0.10	☑	94/95 OVERLAY PROGRAM
7/31/1984	OL-AS	Overlay - AC Structural	23,839.00	2.50	☑	84/85 OVERLAY PROGRAM

Roadway	Seventh Avenue	
Section	4	
Traffic Class	A - ARTERIAL	
PCI-before/Date	96	9-13-1999
Treatment/Year	DCS-SS	8-24-2000
PCI-final/service year	90	3
Age	5	
Asphalt Concrete Layer	Total: 5.50" 1995: 3.00" 1984: 2.50"	



SOUTHWOOD BOULEVARD SECTION 1

1/23/2015

Work History Report

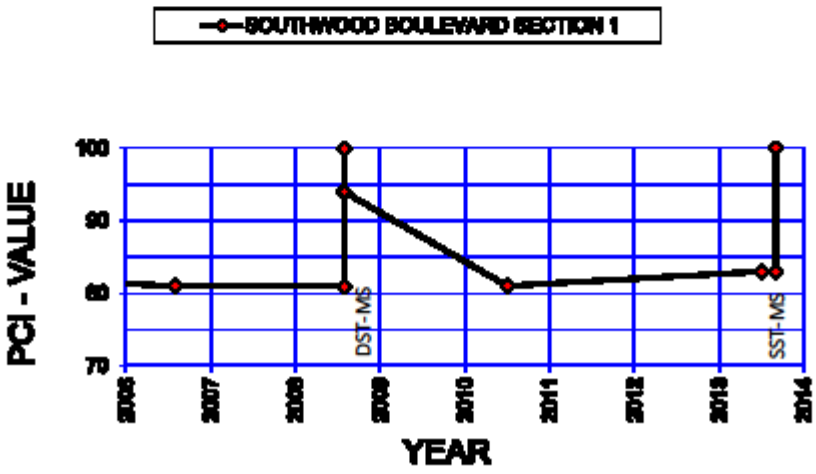
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0202 SOUTHWOOD B **Section:** 1 **Surface:** STMicro

L.C.D.: 7/15/1988 **Use:** ROADWA **Rank:** B **Length:** 1,779.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 46,468.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/22/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		2013 RTC PREVENTIVE MAINT. PROGRAM
7/31/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
10/6/2003	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC / RE-DONE 2004
7/28/1997	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	96/97 SLURRY SEAL
7/15/1988	OL-AS	Overlay - AC Structural	21,820.00	2.50	☑	87/88 OVERLAY PROGRAM
9/2/1974	OL-AS	Overlay - AC Structural	13,965.00	2.50	☑	74/75 OVERLAY PROGRAM

Roadway	SOUTHWOOD BOULEVARD	
Section	1	
Traffic Class	B - COLLECTOR	
PCI-before/Date	81	7-11-2006
Treatment/Year	DCS-MS	7-31-2008
PCI-final/service year	83	5
Age	5	
Asphalt Concrete Layer	Total: 5.00" 1988: 2.50" 1974: 2.50"	



SOUTHWOOD BOULEVARD SECTION 2

1/23/2015

Work History Report

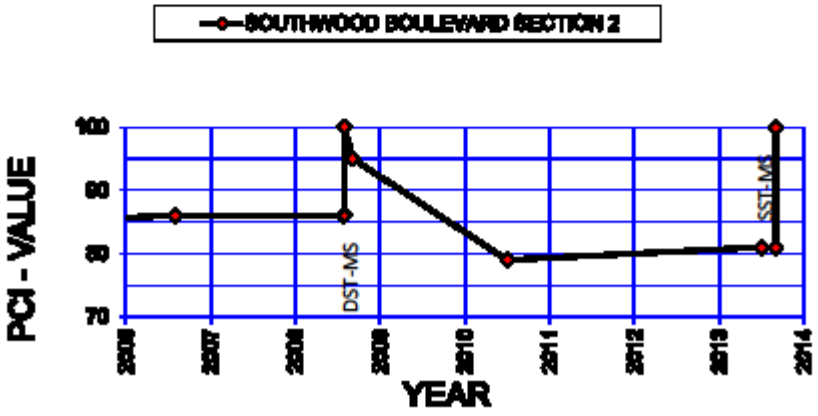
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0202 SOUTHWOOD B **Section:** 2 **Surface:** STMicro

L.C.D.: 7/15/1988 **Use:** ROADWA **Rank:** B **Length:** 3,864.00 (Ft) **Width:** 27.00 (Ft) **True Area:** 111,170.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/22/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		2013 RTC PREVENTIVE MAINT. PROGRAM
7/31/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
10/6/2003	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC / RE-DONE 2004
7/28/1997	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	96/97 SLURRY SEAL
7/15/1988	OL-AS	Overlay - AC Structural	53,096.00	2.50	☑	87/88 OVERLAY PROGRAM
11/13/1978	OL-AS	Overlay - AC Structural	1,404.00	2.50	☑	78/79 OVERLAY PROGRAM
9/15/1976	OL-AS	Overlay - AC Structural	29,734.00	2.50	☑	76/77 OVERLAY PROGRAM

Roadway	Southwood Boulevard	
Section	2	
Traffic Class	B - COLLECTOR	
PCI-before/Date	86	7-11-2006
Treatment/Year	DCS-MS	7-31-2008
PCI-final/service year	81	5
Age	5	
Asphalt Concrete Layer	Total: 7.50" 1988: 2.50" 1978: 2.50" 1976: 2.50"	



SADDLEBOW DRIVE SECTION 1

1/23/2015

Work History

Report

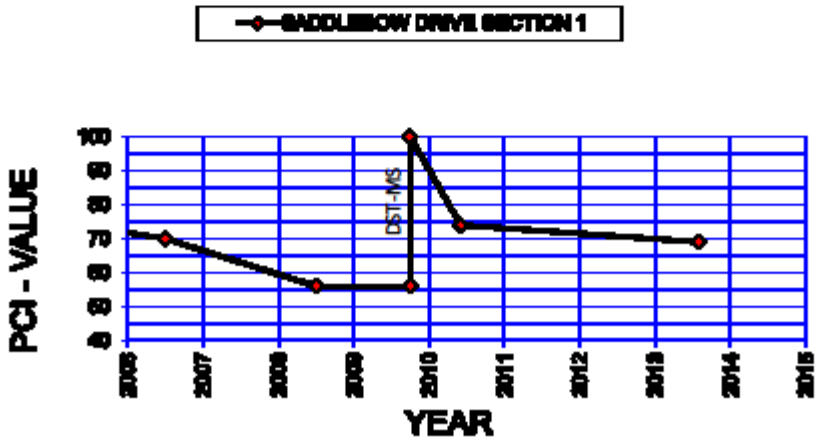
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** L6359 SADDLEBOWD **Section:** 1 **Surface:** STCape

L.C.D.: 11/15/199 **Use:** ROADWA **Rank:** C **Length:** 3,034.00 (Ft) **Width:** 33.00 (Ft) **True Area:** 100,501.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
9/17/2009	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50	☐	09/10 SLURRY SEAL THRU RTC (WC FUNDS) 1/2 only
11/16/1990	ST-ST	Surface Treatment - Sand Tar		0.15	☐	
11/15/1990	NC-AC	New Construction - AC		2.50	☑	NEW CONSTRUCTION

Roadway	Saddlebow Drive	
Section	1	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	56	6-4-2008
Treatment/Year	DCS-MS	9-17-2009
PCI-final/service year	69	4
Age	5	
Asphalt Concrete Layer	Total: 2.50" 1990: 2.50"	



VILLAGE BOULEVARD SECTION 1

1/22/2015

Work History Report

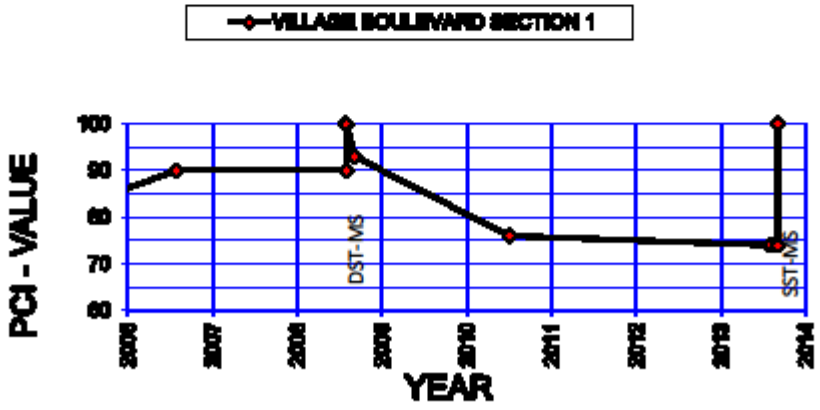
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0087 VILLAGE BOUL **Section:** 1 **Surface:** STMicro

L.C.D.: 7/18/1986 **Use:** ROADWA **Rank:** B **Length:** 1,798.00 (Ft) **Width:** 29.00 (Ft) **True Area:** 54,878.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/23/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		2013 RTC PREVENTIVE MAINT. PROGRAM
7/28/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
8/9/2001	ST-SS	Surface Treatment - Slurry Seal		0.45	☐	00/01 SLURRY SEAL
8/22/1996	ST-SS	Surface Treatment - Slurry Seal	4,378.00	0.38	☐	
7/18/1986	OL-AS	Overlay - AC Structural	25,541.00	2.50	☑	85/86 OVERLAY PROGRAM
9/15/1975	OL-AS	Overlay - AC Structural	16,680.00	2.50	☑	75/76 OVERLAY PROGRAM
9/2/1974	OL-AS	Overlay - AC Structural	16,680.00	2.50	☑	74/75 OVERLAY PROGRAM

Roadway	Village Boulevard	
Section	1	
Traffic Class	B - COLLECTOR	
PCI-before/Date	90	7-20-2006
Treatment/Year	DCS-MS	7-28-2008
PCI-final/service year	74	5
Age	5	
Asphalt Concrete Layer	Total: 7.50" 1986: 2.50" 1975: 2.50" 1974: 2.50"	



VILLAGE BOULEVARD SECTION 2

1/22/2015

Work History Report

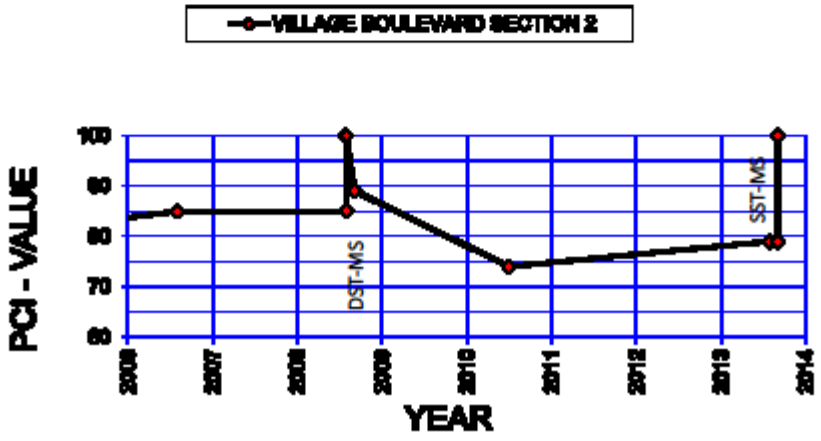
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0087 VILLAGE BOUL **Section:** 2 **Surface:** STMicro

L.C.D.: 8/14/1996 **Use:** ROADWA **Rank:** B **Length:** 1,123.00 (Ft) **Width:** 29.00 (Ft) **True Area:** 32,567.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/23/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	2013 RTC PREVENTIVE MAINT. PROGRAM
7/28/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50	☐	08/09 SLURRY SEAL PROGRAM
8/9/2001	ST-SS	Surface Treatment - Slurry Seal		0.45	☐	00/01 SLURRY SEAL
8/14/1996	OL-AS	Overlay - AC Structural	0.00	2.50	☑	95/96 INCLINE OVERLAY PROGRA
7/18/1986	OL-AS	Overlay - AC Structural	12,569.00	2.50	☑	85/86 OVERLAY PROGRAM
9/15/1975	OL-AS	Overlay - AC Structural	8,208.00	2.50	☑	75/76 OVERLAY PROGRAM

Roadway	Village Boulevard	
Section	2	
Traffic Class	B - COLLECTOR	
PCI-before/Date	85	7-20-2006
Treatment/Year	DCS-MS	7-28-2008
PCI-final/service year	79	5
Age	5	
Asphalt Concrete Layer	Total: 7.50" 1996: 2.50" 1986: 2.50" 1975: 2.50"	



VILLAGE BOULEVARD SECTION 3

1/22/2015

Work History Report

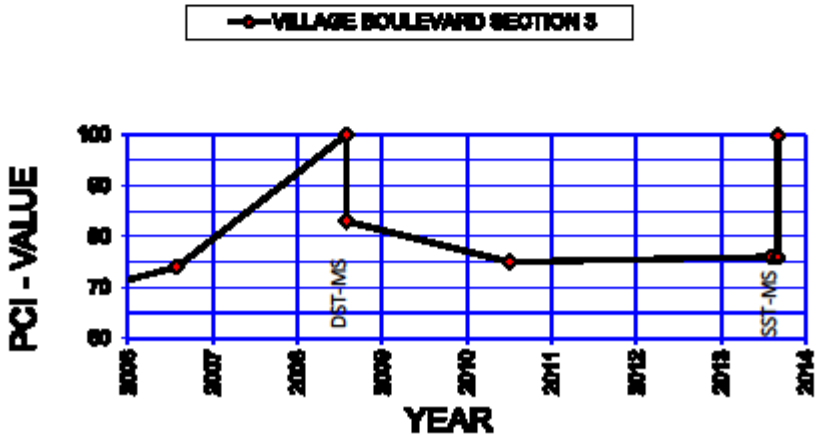
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0087 VILLAGE BOUL **Section:** 3 **Surface:** STMicro

L.C.D.: 8/10/1995 **Use:** ROADWA **Rank:** B **Length:** 562.00 (Ft) **Width:** 35.00 (Ft) **True Area:** 20,909.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/23/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		2013 RTC PREVENTIVE MAINT. PROGRAM
7/28/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
8/9/2001	ST-SS	Surface Treatment - Slurry Seal		0.45	☐	00/01 SLURRY SEAL
8/10/1995	OL-AS	Overlay - AC Structural	12,876.00	2.50	☑	94/95 OVERLAY PROGRAM
9/15/1975	OL-AS	Overlay - AC Structural	6,379.00	2.50	☑	75/76 OVERLAY PROGRAM

Roadway	Village Boulevard	
Section	3	
Traffic Class	B - COLLECTOR	
PCI-before/Date	74	7-20-2006
Treatment/Year	DCS-MS	7-28-2008
PCI-final/service year	76	5
Age	5	
Asphalt Concrete Layer	Total: 5.00” 1995: 2.50” 1975: 2.50”	



COUNTRY CLUB DRIVE SECTION 1

1/21/2015

Work History Report

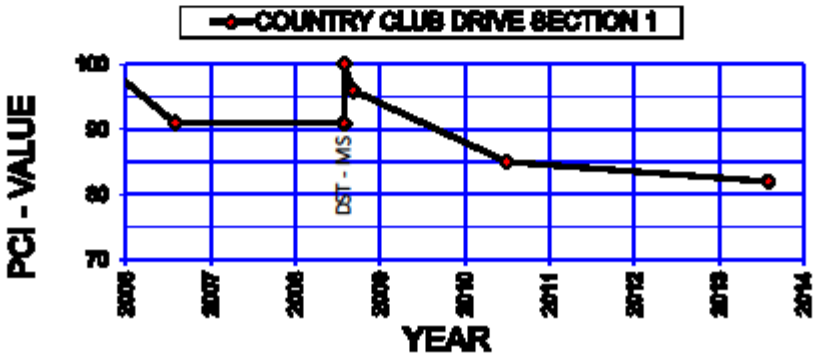
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0109 COUNTRY CLUB **Section:** 1 **Surface:** STCape

L.C.D.: 7/18/1988 **Use:** ROADWA **Rank:** B **Length:** 2,785.00 (Ft) **Width:** 29.00 (Ft) **True Area:** 82,789.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/22/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
9/7/2005	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC SLURRY SEAL PROGRAM
8/21/2002	ST-MS	Surface Treatment - Micro Surfacing		0.50	☐	02/03 SLURRY SEAL PROGRAM
8/7/1995	ST-SS	Surface Treatment - Slurry Seal	6,343.00	0.38	☐	94/95 incline slurry seal program
7/18/1988	OL-AS	Overlay - AC Structural	37,576.00	2.50	☑	87/88 OVERLAY PROGRAM
10/3/1977	OL-AS	Overlay - AC Structural	27,055.00	2.50	☑	77/78 OVERLAY PROGRAM
5/15/1963	NC-AC	New Construction - AC	0.00	0.00	☑	OLD S.R. 27 (NEED DATES & MATE

Roadway	Country Club Drive	
Section	1	
Traffic Class	B - COLLECTOR	
PCI-before/Date	91	7-13-2006
Treatment/Year	DCS-MS	7-22-2008
PCI-final/service year	82	5
Age	6	
Asphalt Concrete Layer	Total: 5.00" 1988: 2.50" 1977: 2.50"	



RED ROCK ROAD SECTION 4

1/23/2015

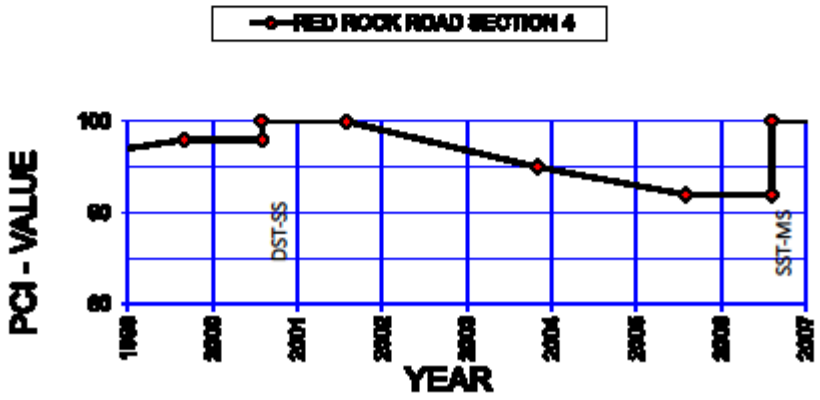
Work History Report

Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** L2200 RED ROCK ROA **Section:** 004 **Surface:** STMicro
L.C.D.: 7/16/1995 **Use:** ROADWA **Rank:** A **Length:** 5,973.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 143,352.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
6/30/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC 2013
6/26/2006	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC SLURRY SEAL PROGRAM
7/28/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	99/00 SLURRY SEAL
7/16/1995	NC-AC	New Construction - AC	0.00	3.00	☑	RTC - SUMMER OF 1995
7/15/1995	NC-AC	New Construction - AC	0.00	3.00	☑	RTC - SUMMER OF 1995
7/6/1984	NC-AC	New Construction - AC	46,800.00	2.50	☑	84/85 OVERLAY PROGRAM - BASE
8/20/1977	NC-AC	New Construction - AC		2.50	☑	NEW CONSTRUCTION

Roadway	Red Rock Road	
Section	4	
Traffic Class	A - ARTERIAL	
PCI-before/Date	98	8-19-1999
Treatment/Year	DCS-SS	7-28-2000
PCI-final/service year	92	5
Age	6	
Asphalt Concrete Layer	Total: 8.00" 1995: 3.00" 1984: 2.50" 1977: 2.50"	



RED ROCK ROAD SECTION 6

1/23/2015

Work History Report

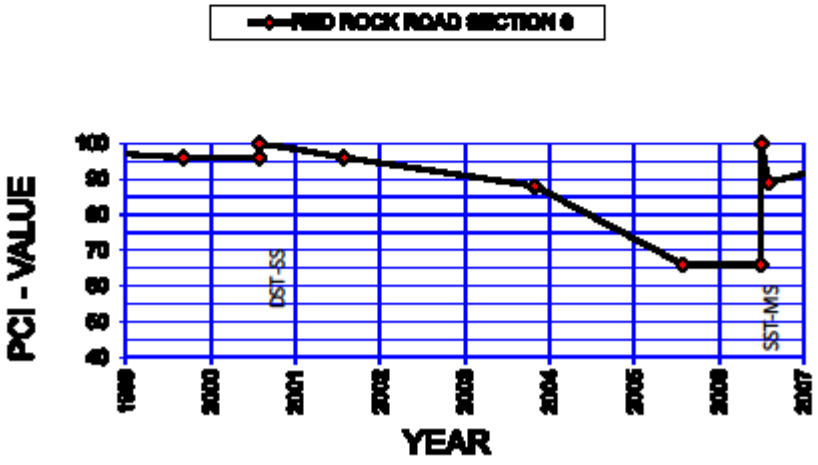
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** L2200 RED ROCK ROA **Section:** 006 **Surface:** AAC

L.C.D.: 7/22/2013 **Use:** ROADWA **Rank:** A **Length:** 14,210.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 341,040.01 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/22/2013	OL-AS	Overlay - AC Structural	0.00	2.00	✔	RTC RECONSTRUCTION PROGRAM
7/18/2013	AR-CO	AC Surface Recycling - Cold	0.00	3.00	✔	RTC RECONSTRUCTION PROGRAM
6/26/2006	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC SLURRY SEAL PROGRAM
7/28/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50		99/00 SLURRY SEAL
9/15/1995	NC-AC	New Construction - AC		3.00	✔	1995 UNPAVED ROADS

Roadway	Red Rock Road	
Section	6	
Traffic Class	A - ARTERIAL	
PCI-before/Date	96	8-19-1999
Treatment/Year	DCS-SS	7-28-2000
PCI-final/service year	66	5
Age	6	
Asphalt Concrete Layer	Total: 3.00" 1995: 3.00"	



SKY WAY SECTION 1

1/23/2015

Work History Report

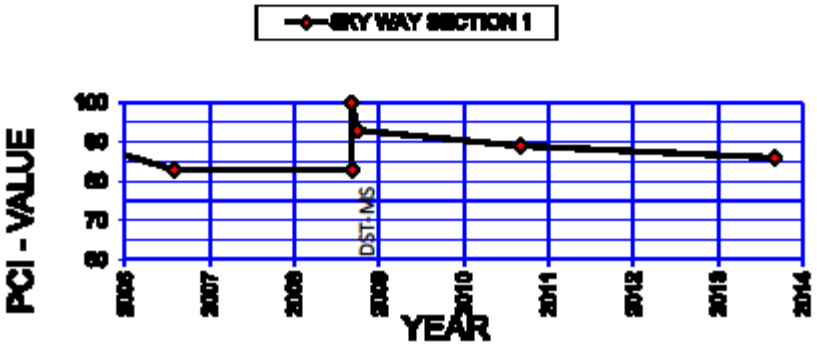
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0198 SKIWAY **Section:** 1 **Surface:** STCape

L.C.D.: 9/4/1998 **Use:** ROADWA **Rank:** C **Length:** 4,282.00 (Ft) **Width:** 30.00 (Ft) **True Area:** 137,771.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/15/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
8/8/2002	ST-MS	Surface Treatment - Micro Surfacing		0.50		02/03 SLURRY SEAL PROGRAM
9/4/1998	OL-AF	Overlay - AC Fabric	0.00	0.10	☑	97/98 OVERLAY PROGRAM
9/4/1998	OL-AS	Overlay - AC Structural	0.00	2.50	☑	97/98 OVERLAY PROGRAM
7/10/1984	OL-AS	Overlay - AC Structural	63,974.00	2.50	☑	83/84 OVERLAY PROGRAM
10/3/1977	OL-AS	Overlay - AC Structural	9,936.00	2.50	☑	77/78 OVERLAY PROGRAM: FAIRV
9/15/1975	OL-AS	Overlay - AC Structural	33,955.00	2.50	☑	75/76 OVERLAY PROGRAM: COUNT
9/2/1974	OL-AS	Overlay - AC Structural	14,851.00	2.50	☑	74/75 OVERLAY PROGRAM: COUNT
5/15/1963	NC-AC	New Construction - AC	0.00	0.00	☑	OLD S.R. 27 (NEED DATES & MATE

Roadway	Sky Way	
Section	1	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	83	7-20-2006
Treatment/Year	DCS-MS	7-15-2008
PCI-final/service year	86	5
Age	6	
Asphalt Concrete Layer	Total: 12.50” 1988: 2.50” 1984: 2.50” 1977: 2.50” 1975: 2.50” 1974: 2.50”	



SKY WAY SECTION 2

1/23/2015

Work History Report

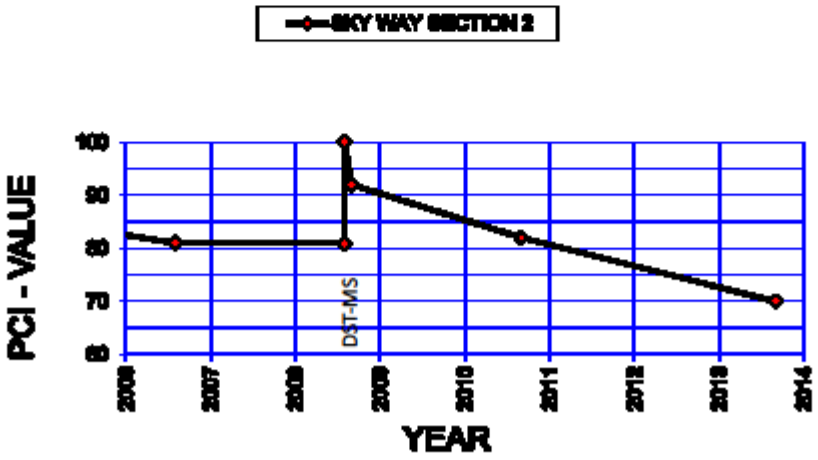
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0198 SKIWAY **Section:** 2 **Surface:** STCape

L.C.D.: 8/15/1997 **Use:** ROADWA **Rank:** C **Length:** 164.00 (Ft) **Width:** 43.00 (Ft) **True Area:** 7,052.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/15/2008	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		08/09 SLURRY SEAL PROGRAM
8/8/2002	ST-MS	Surface Treatment - Micro Surfacing		0.50		02/03 SLURRY SEAL PROGRAM
8/15/1997	OL-AS	Overlay - AC Structural	0.00	2.50	☑	1997 OVERLAY BY IVGID
7/10/1984	OL-AS	Overlay - AC Structural	3,300.00	2.50	☑	83/84 OVERLAY PROGRAM
5/15/1963	NC-AC	New Construction - AC	0.00	0.00	☑	OLD S.R. 27 (NEED DATES & MATE

Roadway	Sky Way	
Section	2	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	81	7-20-2006
Treatment/Year	DCS-MS	7-15-2008
PCI-final/service year	70	5
Age	6	
Asphalt Concrete Layer	Total: 5.00" 1997: 2.50" 1984: 2.50"	



HIGHWAY 34 SECTION 1

1/23/2015

Work History Report

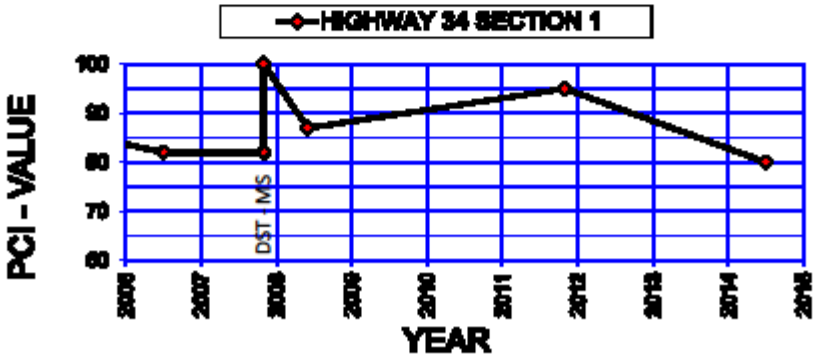
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** G0017 HIGHWAY 34 **Section:** 001 **Surface:** STCape

L.C.D.: 7/15/1975 **Use:** ROADWA **Rank:** E **Length:** 842.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 21,050.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
10/2/2007	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		07/08 SLURRY SEAL PROGRAM
9/28/2001	ST-SS	Surface Treatment - Slurry Seal	0.00	0.38		
7/15/1975	NC-CM	New Construction - Cold Mix	0.00	2.50	☑	INITIAL COLD MIX

Roadway	Highway 34	
Section	1	
Traffic Class	E- RURAL HIGHWAY	
PCI-before/Date	82	6-19-2006
Treatment/Year	DCS-MS	10-2-2007
PCI-final/service year	80	7
Age	7	
Asphalt Concrete Layer	Total: 2.50" 1975: 2.50" (Cold Mix)	



HIGHWAY 34 SECTION 2

1/23/2015

Work History Report

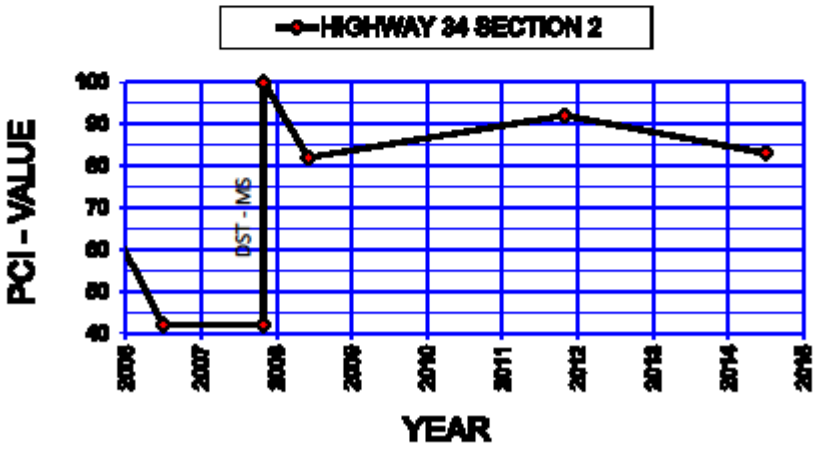
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** G0017 HIGHWAY 34 **Section:** 002 **Surface:** STCape

L.C.D.: 7/15/1975 **Use:** ROADWA **Rank:** E **Length:** 6,358.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 158,950.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
10/2/2007	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		07/08 SLURRY SEAL PROGRAM
10/11/2004	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		04/05 MICRO SEAL ON 34, LAST .45 MILE OF SECTION 2
9/28/2003	ST-SS	Surface Treatment - Slurry Seal	0.00	0.45	☐	03/04 SLURRY SEAL (2370' OF SECT
7/15/1975	NC-CM	New Construction - Cold Mix	0.00	2.50	☑	INITIAL COLD MIX

Roadway	Highway 34	
Section	2	
Traffic Class	E- RURAL HIGHWAY	
PCI-before/Date	42	6-19-2006
Treatment/Year	DCS-MS	10-2-2007
PCI-final/service year	83	7
Age	7	
Asphalt Concrete Layer	Total: 2.50" 1975: 2.50" (Cold Mix)	



HIGHWAY 34 SECTION 3

1/23/2015

Work History Report

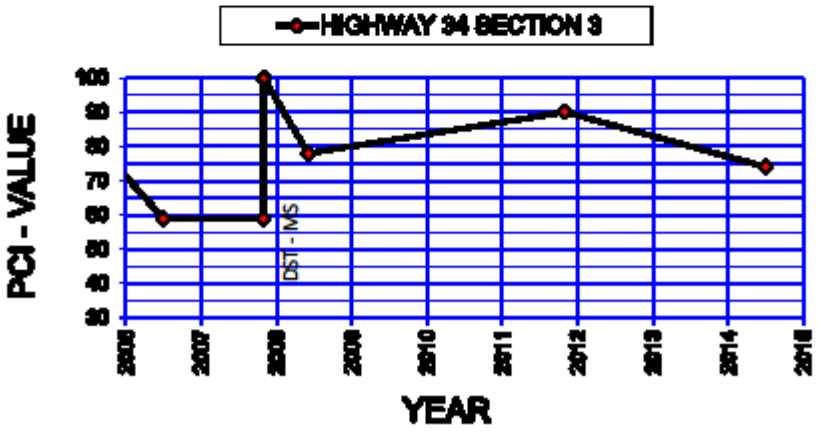
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** G0017 HIGHWAY 34 **Section:** 003 **Surface:** STCape

L.C.D.: 7/15/1975 **Use:** ROADWA **Rank:** E **Length:** 17,032.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 408,768.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
10/2/2007	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		07/08 SLURRY SEAL PROGRAM
10/11/2004	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		04/05 MICRO SEAL ON 34, .65 & .4 MILES OF SECTION 3
9/20/2002	ST-SS	Surface Treatment - Slurry Seal	0.00	0.45	☐	
7/15/1975	NC-CM	New Construction - Cold Mix	0.00	2.50	☑	INITIAL COLD MIX

Roadway	Highway 34	
Section	3	
Traffic Class	E- RURAL HIGHWAY	
PCI-before/Date	59	6-19-2006
Treatment/Year	DCS-MS	10-2-2007
PCI-final/service year	74	7
Age	7	
Asphalt Concrete Layer	Total: 2.50" 1975: 2.50" (Cold Mix)	



HIGHWAY 34 SECTION 4

1/23/2015

Work History Report

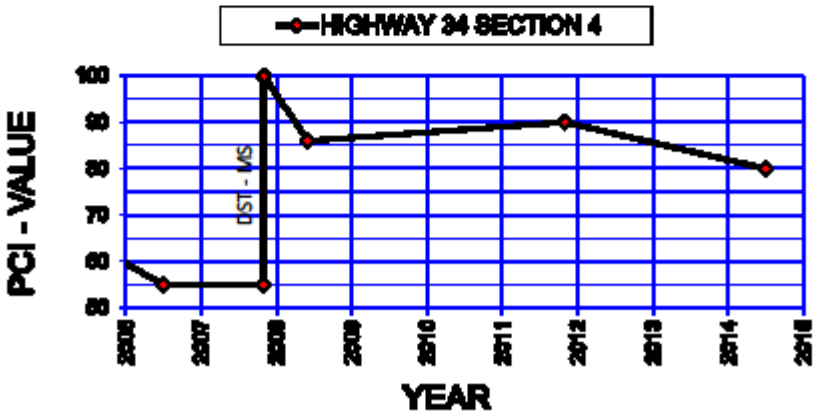
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** G0017 HIGHWAY 34 **Section:** 004 **Surface:** STCape

L.C.D.: 7/15/1975 **Use:** ROADWA **Rank:** E **Length:** 11,427.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 285,675.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
10/2/2007	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		07/08 SLURRY SEAL PROGRAM
8/13/2002	ST-SS	Surface Treatment - Slurry Seal	0.00	0.38		
7/15/1975	NC-CM	New Construction - Cold Mix	0.00	2.50	☑	INITIAL COLD MIX

Roadway	Highway 34	
Section	3	
Traffic Class	E- RURAL HIGHWAY	
PCI-before/Date	55	6-19-2006
Treatment/Year	DCS-MS	10-2-2007
PCI-final/service year	80	7
Age	7	
Asphalt Concrete Layer	Total: 2.50" 1975: 2.50" (Cold Mix)	



EAST LAKE BOULEVARD SECTION 5

1/21/2015

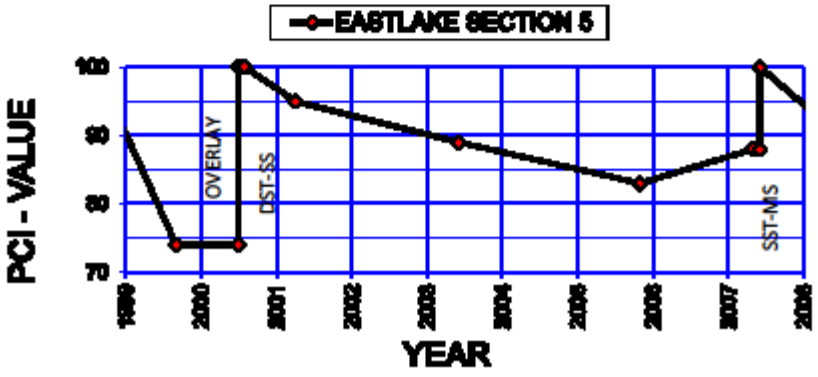
Work History Report

Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 005 **Surface:** STMicro
L.C.D.: 6/13/2000 **Use:** ROADWA **Rank:** A **Length:** 1,571.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 39,275.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/5/2012	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC SLURRY SEAL PROGRAM
5/11/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC SLURRY SEAL PROGRAM
7/25/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	99/00 SLURRY SEAL
6/13/2000	OL-AT	Overlay - AC Thin		1.50	☑	00/01 OVERLAY PROGRAM
6/29/1998	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	97/98 SLURRY SEAL
7/30/1987	OL-AS	Overlay - AC Structural	35,719.00	2.50	☑	87/88 OVERLAY PROGRAM
8/30/1984	OL-AS	Overlay - AC Structural		2.50	☑	83/84 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	5	
Traffic Class	A - ARTERIAL	
PCI-before/Date	100	6-13-2000
Treatment/Year	DCS-SS	7-25-2000
PCI-final/service year	83	5
Age	7	
Asphalt Concrete Layer	Total: 6.50" 2000: 1.50" 1987: 2.50" 1984: 2.50"	



EAST LAKE BOULEVARD SECTION 9

1/21/2015

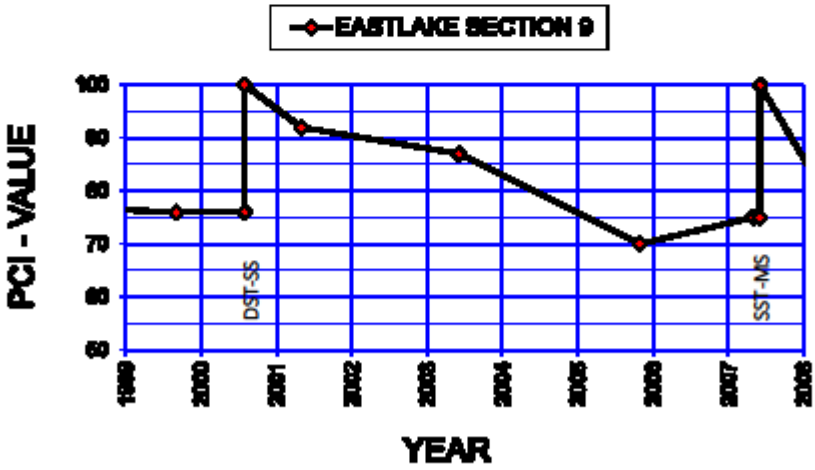
Work History Report

Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 009 **Surface:** STMicro
L.C.D.: 7/14/1982 **Use:** ROADWA **Rank:** A **Length:** 4,683.00 (Ft) **Width:** 23.00 (Ft) **True Area:** 107,709.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/11/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC 07
7/24/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50		99/00 SLURRY SEAL
7/14/1982	OL-AS	Overlay - AC Structural	35,632.00	2.50	☑	81/82 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	9	
Traffic Class	A - ARTERIAL	
PCI-before/Date	76	8-21-1999
Treatment/Year	DCS-SS	7-24-2000
PCI-final/service year	75	7
Age	7	
Asphalt Concrete Layer	Total: 2.50" 1982: 2.50"	



EAST LAKE BOULEVARD SECTION 10

1/21/2015

Work History Report

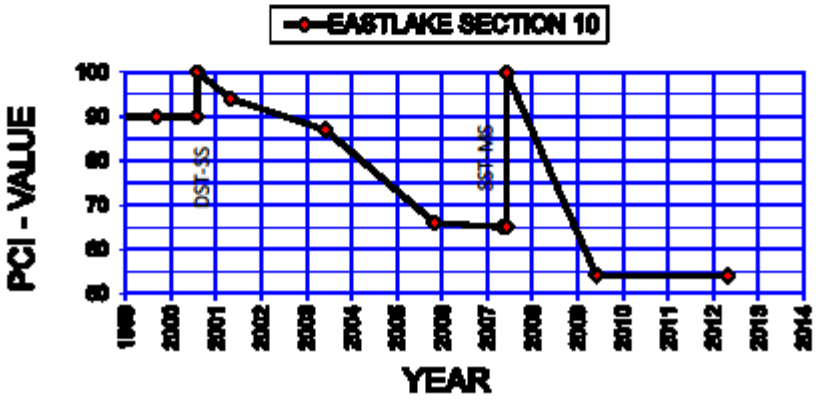
Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 010 **Surface:** STMicro

L.C.D.: 6/3/1992 **Use:** ROADWA **Rank:** A **Length:** 7,712.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 185,088.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/11/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC 07
7/24/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50		99/00 SLURRY SEAL
6/3/1992	OL-AS	Overlay - AC Structural	43,440.00	2.50	☑	91/92 OVERLAY PROGRAM
8/30/1984	OL-AS	Overlay - AC Structural	33,883.00	2.50	☑	84/85 OVERLAY PROGRAM
7/14/1982	OL-AS	Overlay - AC Structural		2.50	☑	83/84 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	10	
Traffic Class	A - ARTERIAL	
PCI-before/Date	90	8-21-1999
Treatment/Year	DCS-SS	7-24-2000
PCI-final/service year	65	7
Age	7	
Asphalt Concrete Layer	Total: 7.50" 1992: 2.50" 1984: 2.50" 1982: 2.50"	



EAST LAKE BOULEVARD SECTION 11

1/21/2015

Work History Report

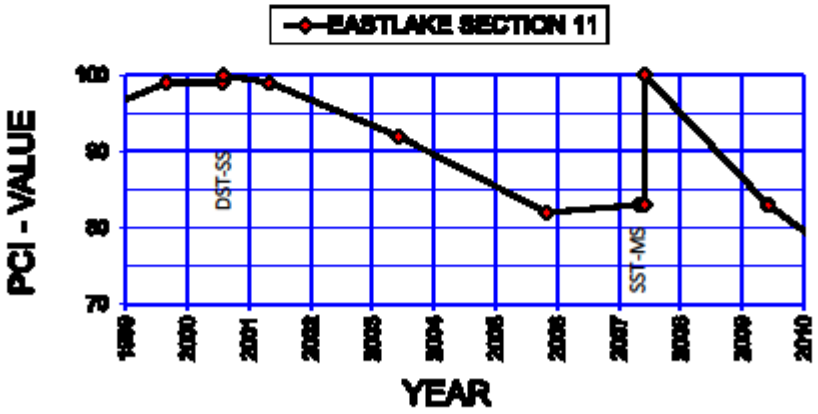
Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 011 **Surface:** STMicro

L.C.D.: 8/30/1995 **Use:** ROADWA **Rank:** A **Length:** 2,588.00 (Ft) **Width:** 23.00 (Ft) **True Area:** 59,524.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/11/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC 07
7/24/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50		99/00 SLURRY SEAL
8/30/1995	OL-AS	Overlay - AC Structural	38,466.00	2.50	☑	94/95 OVERLAY PROGRAM
8/30/1984	OL-AS	Overlay - AC Structural		2.50	☑	83/84 OVERLAY PROGRAM
6/15/1983	OL-AS	Overlay - AC Structural	22,185.00	2.50	☑	82/83 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	11	
Traffic Class	A - ARTERIAL	
PCI-before/Date	99	8-21-1999
Treatment/Year	DCS-SS	7-24-2000
PCI-final/service year	83	7
Age	7	
Asphalt Concrete Layer	Total: 7.50" 1995: 2.50" 1984: 2.50" 1983: 2.50"	



EAST LAKE BOULEVARD SECTION 12

1/21/2015

Work History Report

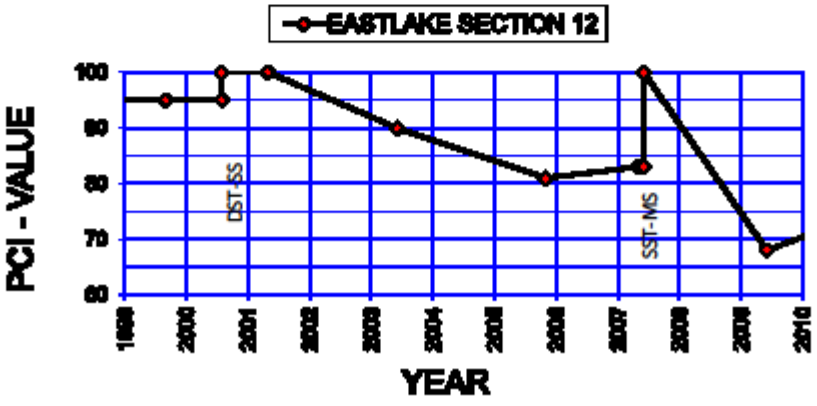
Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 012 **Surface:** STMicro

L.C.D.: 6/27/1994 **Use:** ROADWA **Rank:** A **Length:** 2,145.00 (Ft) **Width:** 23.00 (Ft) **True Area:** 49,335.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/11/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC 07
7/17/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50		99/00 SLURRY SEAL
6/27/1994	OL-AS	Overlay - AC Structural	0.00	2.50	☑	93/94 OVERLAY PROGRAM
8/30/1984	OL-AS	Overlay - AC Structural		2.50	☑	83/84 OVERLAY PROGRAM
6/15/1983	OL-AS	Overlay - AC Structural	18,381.00	2.50	☑	82/83 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	12	
Traffic Class	A - ARTERIAL	
PCI-before/Date	95	8-21-1999
Treatment/Year	DCS-SS	7-17-2000
PCI-final/service year	83	7
Age	7	
Asphalt Concrete Layer	Total: 7.50" 1994: 2.50" 1984: 2.50" 1983: 2.50"	



EAST LAKE BOULEVARD SECTION 13

1/21/2015

Work History Report

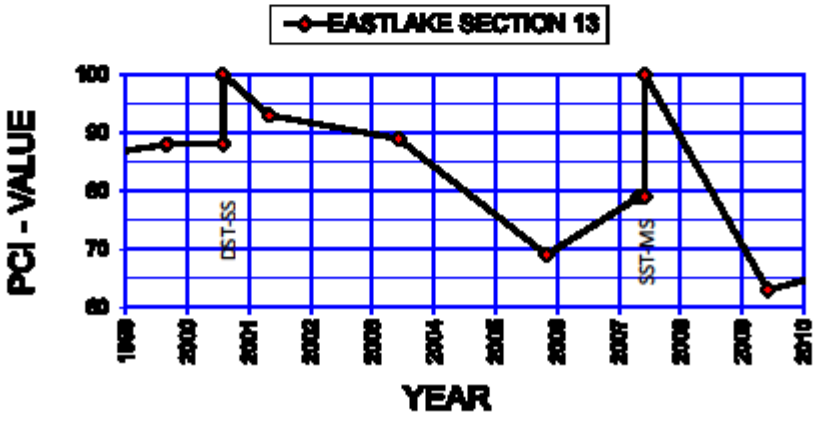
Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 013 **Surface:** STMicro

L.C.D.: 6/3/1992 **Use:** ROADWA **Rank:** A **Length:** 3,607.00 (Ft) **Width:** 23.00 (Ft) **True Area:** 82,961.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/11/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC 07
7/17/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50		99/00 SLURRY SEAL
6/3/1992	OL-AS	Overlay - AC Structural	40,790.00	2.50	☑	91/92 OVERLAY PROGRAM
6/15/1983	OL-AS	Overlay - AC Structural	30,184.00	2.50	☑	82/83 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	13	
Traffic Class	A - ARTERIAL	
PCI-before/Date	88	8-21-1999
Treatment/Year	DCS-SS	7-17-2000
PCI-final/service year	79	7
Age	7	
Asphalt Concrete Layer	Total: 5.00" 1992: 2.50" 1983: 2.50"	



EAST LAKE BOULEVARD SECTION 14

1/21/2015

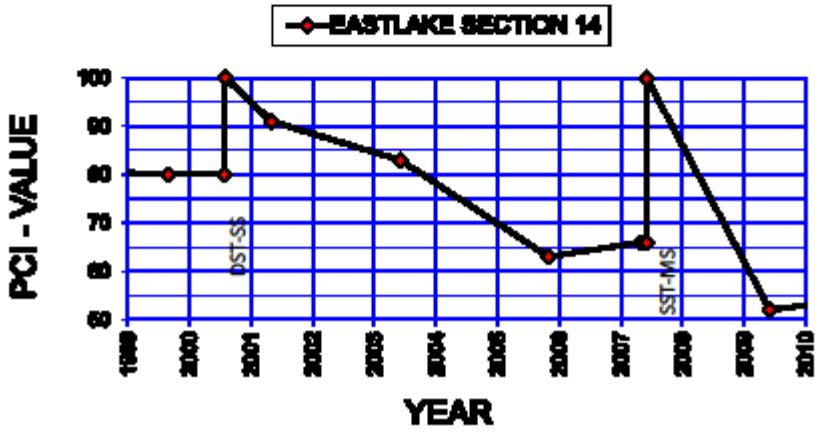
Work History Report

Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKEBOU **Section:** 014 **Surface:** STMicro
L.C.D.: 8/11/1988 **Use:** ROADWA **Rank:** A **Length:** 1,569.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 39,225.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/11/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50		RTC 07
7/18/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50		99/00 SLURRY SEAL
8/11/1988	OL-AS	Overlay - AC Structural	15,953.00	2.50	☑	88/89 OVERLAY PROGRAM
6/15/1983	OL-AS	Overlay - AC Structural	13,726.00	2.50	☑	82/83 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	14	
Traffic Class	A - ARTERIAL	
PCI-before/Date	80	8-21-1999
Treatment/Year	DCS-SS	7-18-2000
PCI-final/service year	66	7
Age	7	
Asphalt Concrete Layer	Total: 5.00" 1988: 2.50" 1983: 2.50"	



KNOTTY PINE DRIVE SECTION 1

1/23/2015

Work History Report

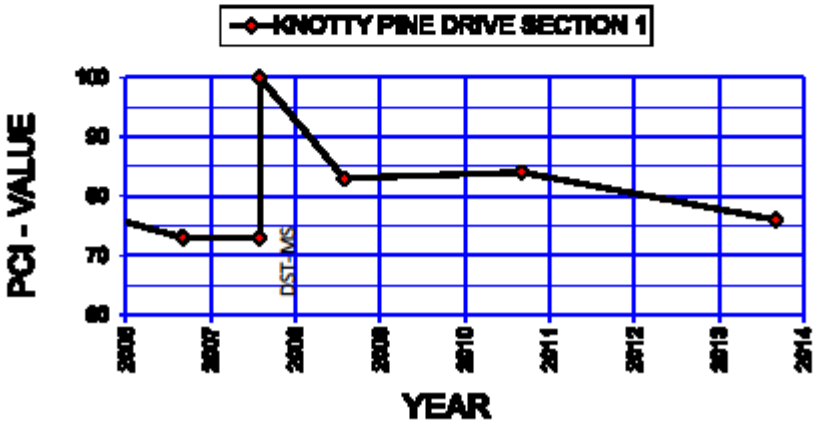
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0203 KNOTTY PINE D **Section:** 1 **Surface:** STCape

L.C.D.: 8/14/1990 **Use:** ROADWA **Rank:** C **Length:** 533.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 13,625.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/30/2007	ST-CS	Surface Treatment Double - Cape Seal	4,768.79	0.50		07/08 SLURRY SEAL PROGRAM
9/10/1998	ST-SS	Surface Treatment - Slurry Seal		0.38		97/98 SLURRY SEAL
8/14/1990	OL-AS	Overlay - AC Structural	0.00	2.50	☑	89\90 OVERLAY PROGRAM
11/13/1978	OL-AS	Overlay - AC Structural	5,073.00	2.50	☑	78\79 OVERLAY PROGRAM

Roadway	Knotty Pine Drive	
Section	1	
Traffic Class	C- RESIDENTIAL	
PCI-before/Date	73	8-11-2006
Treatment/Year	DCS-MS	7-30-2007
PCI-final/service year	76	6
Age	7	
Asphalt Concrete Layer	Total: 5.00" 1990: 2.50" 1978: 2.50"	



KNOTTY PINE DRIVE SECTION 2

1/23/2015

Work History Report

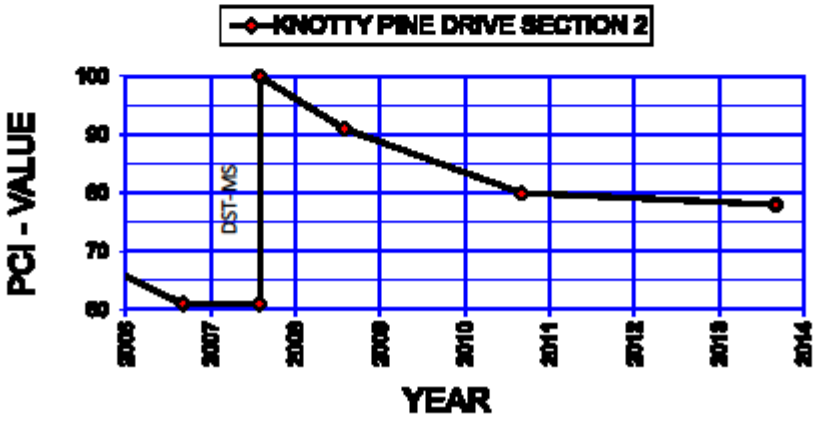
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** I0203 KNOTTY PINE D **Section:** 2 **Surface:** STCape

L.C.D.: 8/15/1995 **Use:** ROADWA **Rank:** C **Length:** 3,751.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 96,575.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/30/2007	ST-CS	Surface Treatment Double - Cape Seal	33,801.53	0.50		07/08 SLURRY SEAL PROGRAM
9/10/1998	ST-SS	Surface Treatment - Slurry Seal		0.38		97/98 SLURRY SEAL
8/15/1995	OL-AS	Overlay - AC Structural	62,836.00	2.50	☑	94/95 OVERLAY PROGRAM
11/13/1978	OL-AS	Overlay - AC Structural	37,744.00	2.50	☑	78/79 OVERLAY PROGRAM

Roadway	Knotty Pine Drive	
Section	2	
Traffic Class	C- RESIDENTIAL	
PCI-before/Date	61	8-11-2006
Treatment/Year	DCS-MS	7-30-2007
PCI-final/service year	78	6
Age	7	
Asphalt Concrete Layer	Total: 5.00" 1995: 2.50" 1978: 2.50"	



OVERLAND ROAD SECTION 1

1/23/2015

Work History Report

Pavement Database: all14_April2014

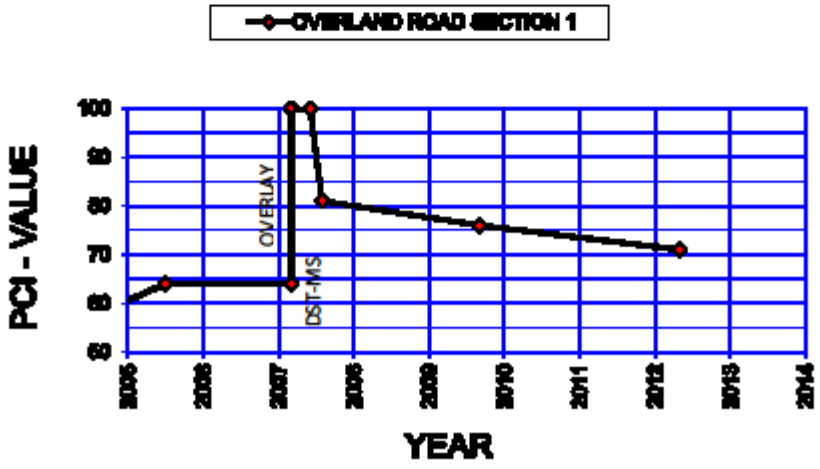
Network: WASHOE COUNTY **Branch:** L2237 OVERLAND RO **Section:** 1 **Surface:** STCape

L.C.D.: 2/17/2007 **Use:** ROADWA **Rank:** C **Length:** 2,154.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 54,885.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/15/2007	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		WATER RESOURES 2007
2/17/2007	OL-AS	Overlay - AC Structural	0.00	2.00	✔	WATER RESOURES 2007
7/9/1990	NC-AC	New Construction - AC		2.50	✔	NEW CONSTRUCTION

Roadway	Overland Road	
Section	1	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	100	2-17-2007
Treatment/Year	DCS-MS	5-15-2007
PCI-final/service year	71	5
Age	7	
Asphalt Concrete Layer	Total: 4.50" 2007: 2.00" 1990: 2.50"	

PCI GRAPH



OVERLAND ROAD SECTION 2

1/23/2015

Work History Report

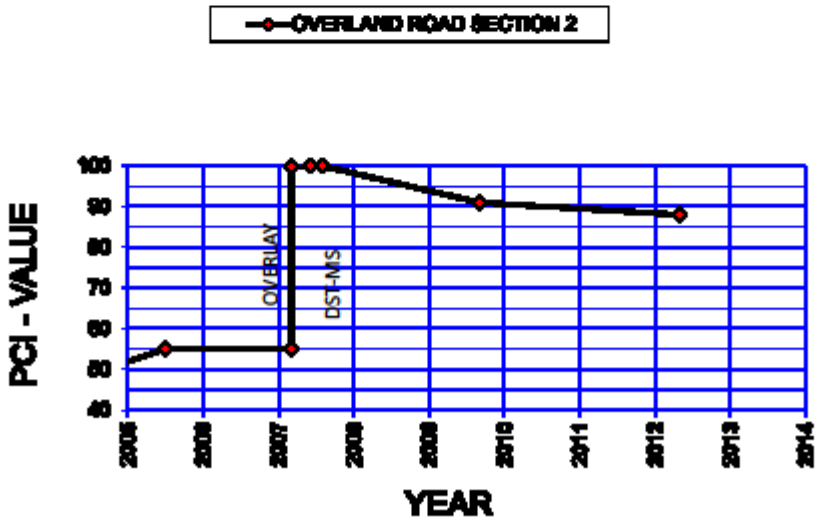
Pavement Database: all14_April2014

Network: WASHOE COUNTY **Branch:** L2237 OVERLAND RO **Section:** 2 **Surface:** STCape

L.C.D.: 2/17/2007 **Use:** ROADWA **Rank:** C **Length:** 1,963.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 49,908.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/15/2007	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50		WATER RESOURES 2007
2/17/2007	OL-AS	Overlay - AC Structural	0.00	2.00	✔	WATER RESOURES 2007
7/9/1991	NC-AC	New Construction - AC		2.50	✔	NEW CONSTRUCTION

Roadway	Overland Road	
Section	2	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	100	2-17-2007
Treatment/Year	DCS-MS	5-15-2007
PCI-final/service year	88	5
Age	7	
Asphalt Concrete Layer	Total: 4.50" 2007: 2.00" 1991: 2.50"	



PONDEROSA AVENUE SECTION 1

1/23/2015

Work History Report

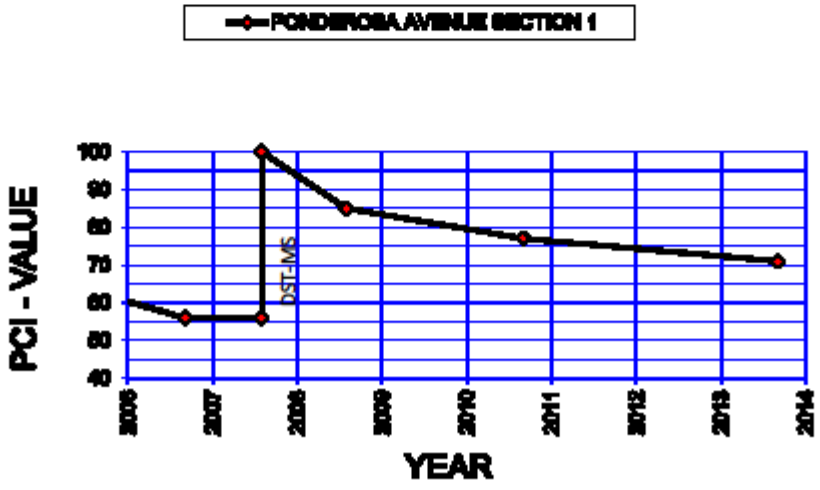
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** I0124 PONDEROSA AV **Section:** 1 **Surface:** STCape

L.C.D.: 6/24/1989 **Use:** ROADWA **Rank:** C **Length:** 4,074.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 102,212.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/30/2007	ST-CS	Surface Treatment Double - Cape Seal	35,774.50	0.50	☐	07/08 SLURRY SEAL PROGRAM
7/26/1999	ST-SS	Surface Treatment - Slurry Seal		0.45	☐	1999 SLURRY SEAL
6/24/1989	OL-AS	Overlay - AC Structural	59,594.00	2.50	☑	89/90 OVERLAY PROGRAM
11/13/1978	OL-AS	Overlay - AC Structural	824.00	2.50	☑	78/79 OVERLAY PROGRAM: S.R. 28
10/3/1977	OL-AS	Overlay - AC Structural	37,232.00	2.50	☑	77/78 OVERLAY PROGRAM

Roadway	Ponderosa Avenue	
Section	1	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	56	8-10-2006
Treatment/Year	DCS-MS	7-30-2007
PCI-final/service year	71	6
Age	7	
Asphalt Concrete Layer	Total: 7.50" 1989: 2.50" 1978: 2.50" 1977: 2.50"	



RED ROCK ROAD SECTION 1

1/23/2015

Work History Report

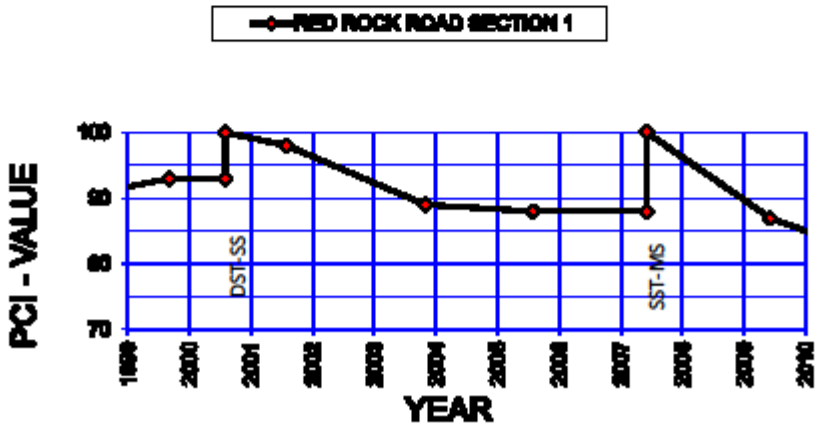
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** L2200 RED ROCK ROA **Section:** 001 **Surface:** STMicro

L.C.D.: 8/23/1995 **Use:** ROADWA **Rank:** A **Length:** 8,745.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 209,880.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
6/30/2013	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC 2013
5/17/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC 07
7/28/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	99/00 SLURRY SEAL
8/23/1995	OL-AS	Overlay - AC Structural	138,325.00	3.00	✔	94/95 OVERLAY PROGRAM
7/6/1984	OL-AS	Overlay - AC Structural	46,800.00	2.50	✔	84/85 OVERLAY PROGRAM
8/20/1977	NC-AC	New Construction - AC		2.50	✔	NEW CONSTRUCTION

Roadway	Red Rock Road	
Section	1	
Traffic Class	A - ARTERIAL	
PCI-before/Date	93	8-19-1999
Treatment/Year	DCS-SS	7-28-2000
PCI-final/service year	88	5
Age	7	
Asphalt Concrete Layer	Total: 8.00" 1995: 3.00" 1984: 2.50" 1977: 2.50"	



SILVERTIP DRIVE SECTION 1

1/23/2015

Work History Report

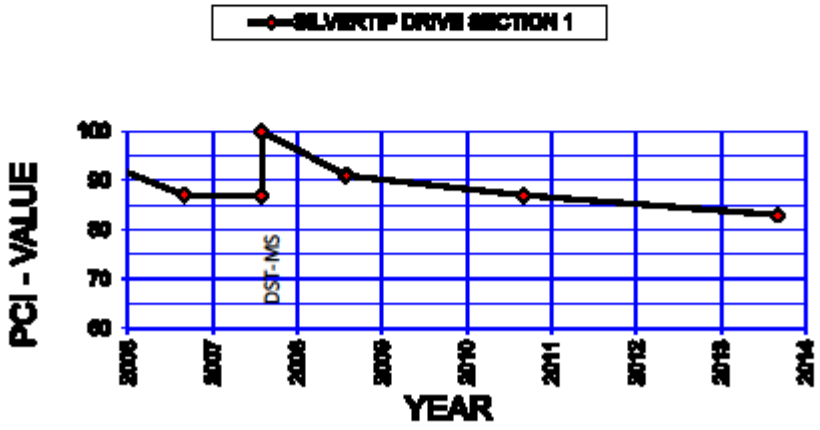
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** I0210 SILVERTIP DRIV **Section:** 1 **Surface:** STCape

L.C.D.: 9/9/2004 **Use:** ROADWA **Rank:** C **Length:** 3,003.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 72,843.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/30/2007	ST-CS	Surface Treatment Double - Cape Seal	25,495.26	0.50	☐	07/08 SLURRY SEAL PROGRAM
9/9/2004	OL-AS	Overlay - AC Structural	0.00	2.50	☑	04/05 OVERLAY PROGRAM - west en
9/8/2004	FA-PL	Fabric Placement	0.00	0.10	☐	04/05 OVERLAY PROGRAM -west en
5/15/1999	OL-AS	Overlay - AC Structural	0.00	2.50	☑	GAS COMPANY east end
7/24/1997	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	96/97 SLURRY SEAL
11/13/1978	OL-AS	Overlay - AC Structural	29,486.00	2.50	☑	78/79 OVERLAY PROGRAM

Roadway	Silvertip Drive	
Section	1	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	87	8-10-2006
Treatment/Year	DCS-MS	7-30-2007
PCI-final/service year	83	6
Age	7	
Asphalt Concrete Layer	Total: 7.50" 2004: 2.50" 1999: 2.50" 1978: 2.50"	



WHITE LAKE PARKWAY SECTION 1

1/23/2015

Work History Report

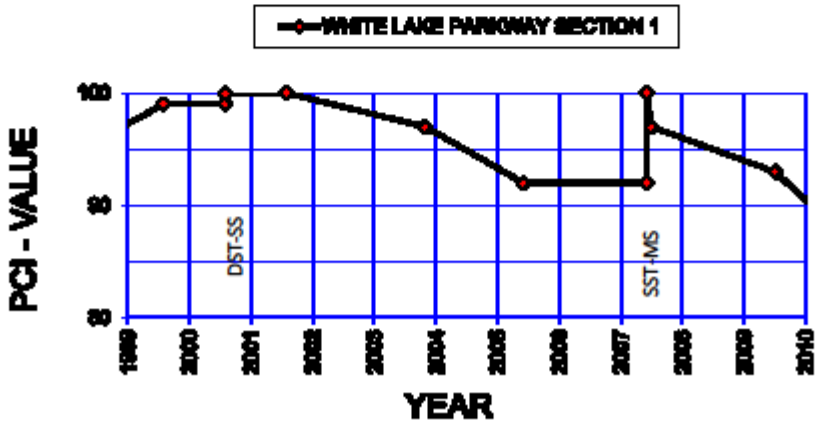
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** L2049 WHITE LAKE PA **Section:** 1 **Surface:** STMicro

L.C.D.: 8/24/1995 **Use:** ROADWA **Rank:** A **Length:** 2,228.00 (Ft) **Width:** 37.00 (Ft) **True Area:** 82,436.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/16/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC 07
7/20/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	99/00 SLURRY SEAL
8/24/1995	OL-AS	Overlay - AC Structural	52,135.00	3.00	☑	94/95 OVERLAY PROGRAM
8/8/1995	OL-AF	Overlay - AC Fabric	0.00	0.10	☑	94/95 OVERLAY PROGRAM
7/8/1980	NC-AC	New Construction - AC		2.50	☑	NEW CONSTRUCTION

Roadway	White Lake Parkway	
Section	1	
Traffic Class	A - ARTERIAL	
PCI-before/Date	99	7-25-1999
Treatment/Year	DCS-SS	7-20-2000
PCI-final/service year	92	5
Age	7	
Asphalt Concrete Layer	Total: 5.50" 1995: 3.00" 1980: 2.50"	



WHITE LAKE PARKWAY SECTION 2

1/23/2015

Work History Report

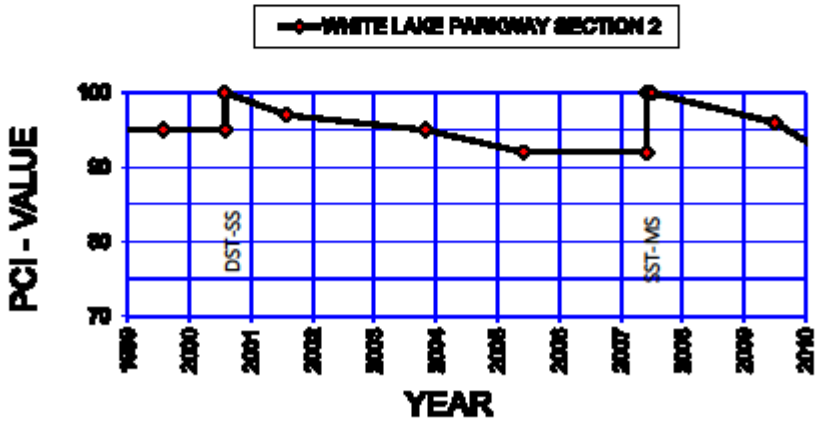
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** L2049 WHITE LAKE PA **Section:** 2 **Surface:** STMicro

L.C.D.: 7/7/1994 **Use:** ROADWA **Rank:** A **Length:** 4,803.00 (Ft) **Width:** 41.00 (Ft) **True Area:** 196,923.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/16/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	5.00	☐	RTC 07
7/20/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	99/00 SLURRY SEAL
7/7/1994	OL-AS	Overlay - AC Structural	0.00	3.00	☑	93/94 OVERLAY PROGRAM
7/8/1980	NC-AC	New Construction - AC		2.50	☑	NEW CONSTRUCTION

Roadway	White Lake Parkway	
Section	2	
Traffic Class	A - ARTERIAL	
PCI-before/Date	95	7-25-1999
Treatment/Year	DCS-SS	7-20-2000
PCI-final/service year	92	5
Age	7	
Asphalt Concrete Layer	Total: 5.50" 1994: 3.00" 1980: 2.50"	



WHITE LAKE PARKWAY SECTION 3

1/23/2015

Work History Report

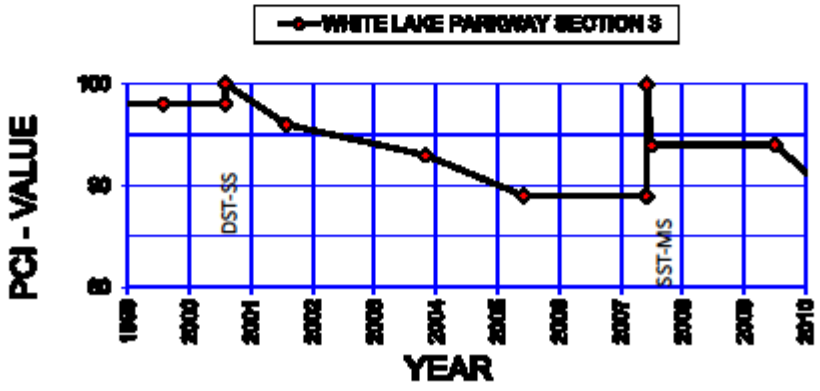
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** L2049 WHITE LAKE PA **Section:** 3 **Surface:** STMicro

L.C.D.: 5/29/1996 **Use:** ROADWA **Rank:** A **Length:** 2,872.00 (Ft) **Width:** 36.00 (Ft) **True Area:** 108,642.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
5/16/2007	ST-MS	Surface Treatment - Micro Surfacing	0.00	0.50	☐	RTC 07
7/20/2000	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	99/00 SLURRY SEAL
5/29/1996	OL-AS	Overlay - AC Structural	0.00	2.50	☑	95/96 OVERLAY PROGRAM
5/29/1996	OL-AT	Overlay - AC Thin	0.00	0.50	☑	95/96 OVERLAY PROGRAM
6/26/1984	OL-AS	Overlay - AC Structural	40,154.00	2.50	☑	84/85 OVERLAY PROGRAM

Roadway	White Lake Parkway	
Section	3	
Traffic Class	A - ARTERIAL	
PCI-before/Date	98	7-25-1999
Treatment/Year	DCS-SS	7-20-2000
PCI-final/service year	89	5
Age	7	
Asphalt Concrete Layer	Total: 5.50" 1996: 2.50" 1996: 0.50" 1984: 2.50"	



ALEXANDER LAKE ROAD SECTION 1

1/21/2015

Work History Report

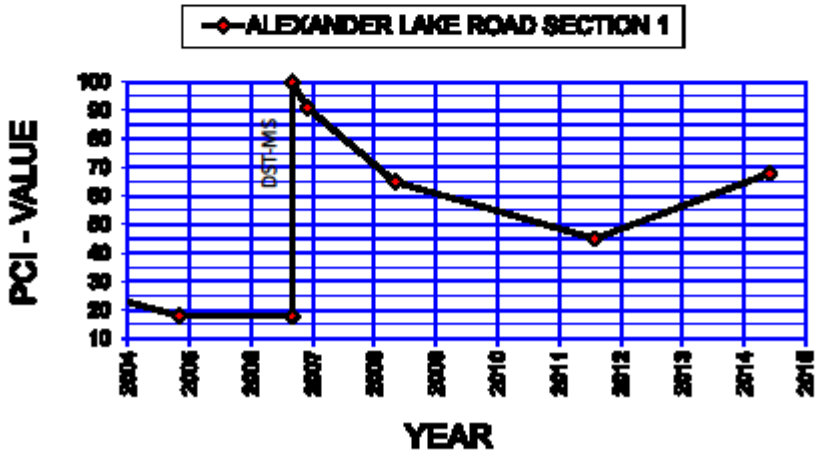
Pavement Database: all14_April2014

Network: SOUTH EAST - HID **Branch:** L1113 ALEXANDERLA **Section:** 1 **Surface:** STCape

L.C.D.: 7/15/1983 **Use:** ROADWA **Rank:** D **Length:** 6,203.00 (Ft) **Width:** 28.00 (Ft) **True Area:** 175,313.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/21/2006	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50	☐	2006 Cape seal with Micro
7/15/1983	NC-AC	New Construction - AC		2.50	✔	NEW CONSTRUCTION

Roadway	Alexander Lake Road	
Section	1	
Traffic Class	D - INDUSTRIAL	
PCI-before/Date	18	10-07-2004
Treatment/Year	DCS-MS	8-21-2006
PCI-final/service year	68	8
Age	8	
Asphalt Concrete Layer	Total: 2.50" 1983: 2.50"	



ALEXANDER LAKE ROAD SECTION 2

1/21/2015

Work History Report

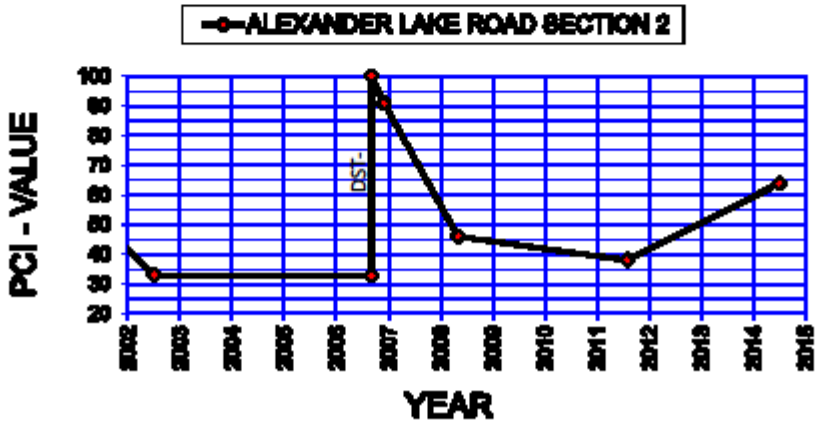
Pavement Database: all14_April2014

Network: SOUTH EAST - HID **Branch:** L1113 ALEXANDERLA **Section:** 2 **Surface:** STCape

L.C.D.: 9/18/1991 **Use:** ROADWA **Rank:** D **Length:** 5,893.00 (Ft) **Width:** 28.00 (Ft) **True Area:** 165,004.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/21/2006	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50	☐	2006 Cape seal with Micro
9/18/1991	NC-AC	New Construction - AC	0.00	4.00	☑	
9/17/1991	BA-AG	Base Course - Aggregate	85,802.00	10.00	☐	

Roadway	Alexander Lake Road	
Section	2	
Traffic Class	D - INDUSTRIAL	
PCI-before/Date	33	6-05-2002
Treatment/Year	DCS-MS	8-21-2006
PCI-final/service year	64	8
Age	8	
Asphalt Concrete Layer	Total: 4.00" 1991: 4.00" 1991: 10.00" AGGREGATE BASE	



ALEXANDER LAKE ROAD SECTION 3

1/21/2015

Work History Report

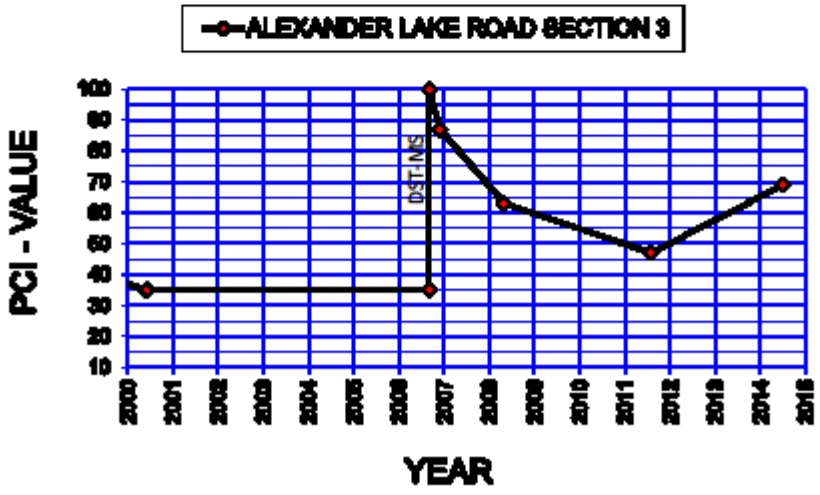
Pavement Database: all14 April2014

Network: SOUTH EAST - HID **Branch:** L1113 ALEXANDERLA **Section:** 3 **Surface:** STCape

L.C.D.: 7/15/1983 **Use:** ROADWA **Rank:** D **Length:** 4,382.00 (Ft) **Width:** 28.00 (Ft) **True Area:** 122,696.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/21/2006	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.50	☐	2006 Cape seal with Micro
7/15/1983	NC-AC	New Construction - AC		2.50	☑	NEW CONSTRUCTION

Roadway	Alexander Lake Road	
Section	3	
Traffic Class	D - INDUSTRIAL	
PCI-before/Date	35	5-05-2000
Treatment/Year	DCS-MS	8-21-2006
PCI-final/service year	69	8
Age	8	
Asphalt Concrete Layer	Total: 2.50" 1983: 2.50"	



EAST LAKE BOULEVARD SECTION 1

1/21/2015

Work History Report

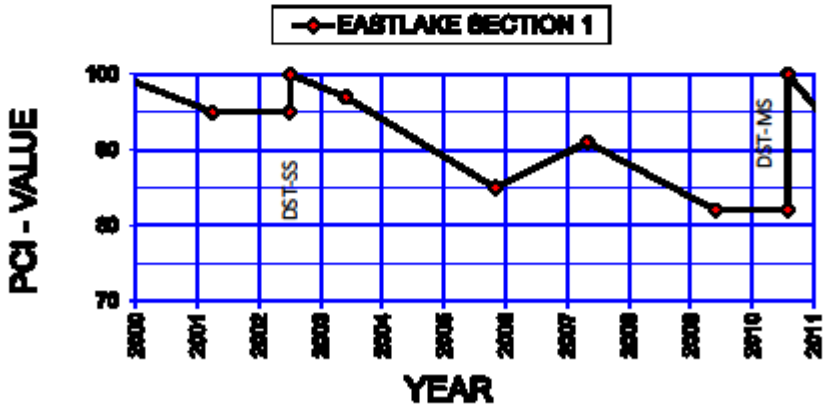
Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKE BOU **Section:** 001 **Surface:** STDMicr

L.C.D.: 7/30/1999 **Use:** ROADWA **Rank:** A **Length:** 1,745.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 41,880.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/8/2010	ST-DM	Surface Treatment Double - Micro Surfacing	0.00	0.60	☐	2010 RTC
6/12/2002	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	02/03 SLURRY SEAL PROGRAM
7/30/1999	OL-AS	Overlay - AC Structural		3.00	☑	98/99 OVERLAY PROGRAM
7/30/1999	FA-PL	Fabric Placement		0.10	☐	98/99 OVERLAY PROGRAM
7/30/1987	OL-AS	Overlay - AC Structural	19,123.00	2.50	☑	87/88 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	1	
Traffic Class	A - ARTERIAL	
PCI-before/Date	95	3-8-2001
Treatment/Year	DCS-SS	6-12-2002
PCI-final/service year	82	7
Age	8	
Asphalt Concrete Layer	Total: 5.50" 1999: 3.00" 1987: 2.50"	



EAST LAKE BOULEVARD SECTION 2

1/21/2015

Work History Report

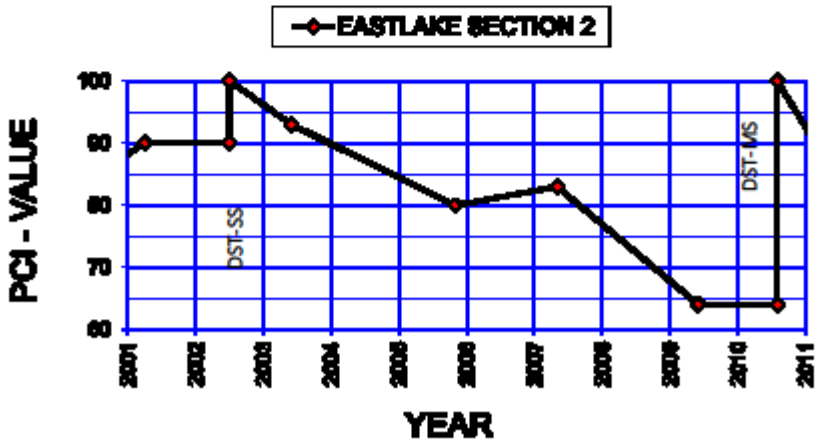
Pavement Database: Washoe County 2013 Data

Network: SOUTH VALLEY - F **Branch:** L3031 EASTLAKE BOU **Section:** 002 **Surface:** STDMicr

L.C.D.: 10/1/1990 **Use:** ROADWA **Rank:** A **Length:** 2,394.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 57,456.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/8/2010	ST-DM	Surface Treatment Double - Micro Surfacing	0.00	0.60	☐	2010 RTC
6/12/2002	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	02/03 SLURRY SEAL PROGRAM
10/1/1990	OL-AS	Overlay - AC Structural	24,100.00	2.50	☑	90\91 OVERLAY PROGRAM
4/13/1981	OL-AS	Overlay - AC Structural	23,438.00	2.50	☑	80/81 OVERLAY PROGRAM

Roadway	East Lake Blvd.	
Section	2	
Traffic Class	A - ARTERIAL	
PCI-before/Date	90	3-8-2001
Treatment/Year	DCS-SS	6-12-2002
PCI-final/service year	64	7
Age	8	
Asphalt Concrete Layer	Total: 5.00" 1990: 2.50" 1981: 2.50"	



VILLAGE PARKWAY SECTION 1

1/23/2015

Work History Report

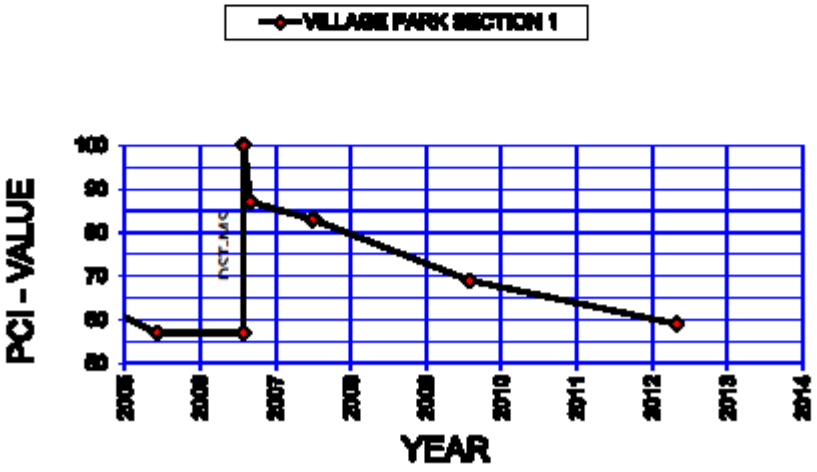
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** L2366 VILLAGEPARK **Section:** 1 **Surface:** STCape

L.C.D.: 9/11/1989 **Use:** ROADWA **Rank:** A **Length:** 3,830.00 (Ft) **Width:** 31.00 (Ft) **True Area:** 118,730.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/31/2006	ST-CS	Surface Treatment Double - Cape Seal	0.00	0.75	☐	RTC 2006 (Micro Cape)
7/28/1998	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	
9/11/1989	OL-AT	Overlay - AC Thin		1.50	☑	
9/10/1989	SA-MI	Stress Absorbing Membrane Interlayer	0.00	0.38	☐	chip seal
8/21/1979	NU-IN	New Construction - Initial		2.50	☑	

Roadway	Village Parkway	
Section	1	
Traffic Class	A - ARTERIAL	
PCI-before/Date	57	5-19-2005
Treatment/Year	DCS-MS	7-31-2006
PCI-final/service year	59	6
Age	8	
Asphalt Concrete Layer	Total: 4.00" 1989: 1.50" 1979: 2.50"	



CHAMPAGNE ROAD SECTON 1

1/21/2015

Work History Report

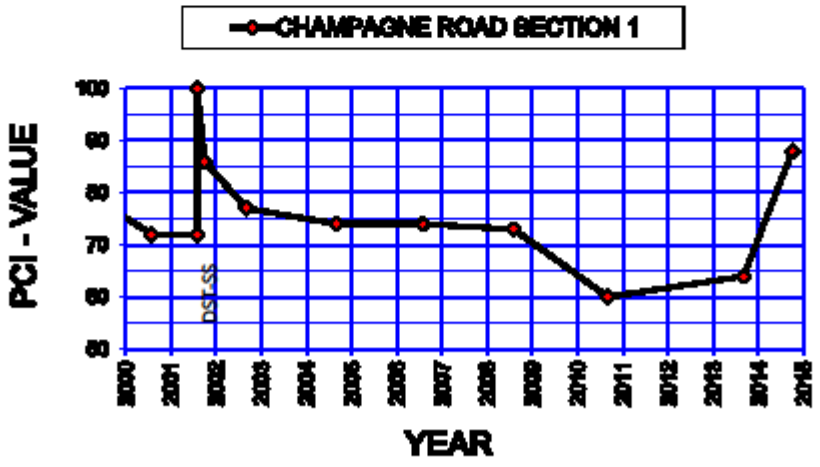
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** I0039 CHAMPAGNE R **Section:** 1 **Surface:** STCape

L.C.D.: 8/14/1995 **Use:** ROADWA **Rank:** C **Length:** 1,778.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 43,075.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/23/2001	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	00/01 SLURRY SEAL
8/14/1995	OL-AS	Overlay - AC Structural	26,449.00	2.00	☑	94/95 OVERLAY PROGRAM
9/26/1980	OL-AS	Overlay - AC Structural	17,904.00	2.50	☑	80/81 OVERLAY PROGRAM

Roadway	Champagne Road	
Section	1	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	72	7-6-2000
Treatment/Year	DCS-SS	7-23-2001
PCI-final/service year	88	13
Age	13	
Asphalt Concrete Layer	Total: 4.50” 1995: 2.00” 1980: 2.50”	



FAIRVIEW BOULEVARD SECTION 2

1/23/2015

Work History Report

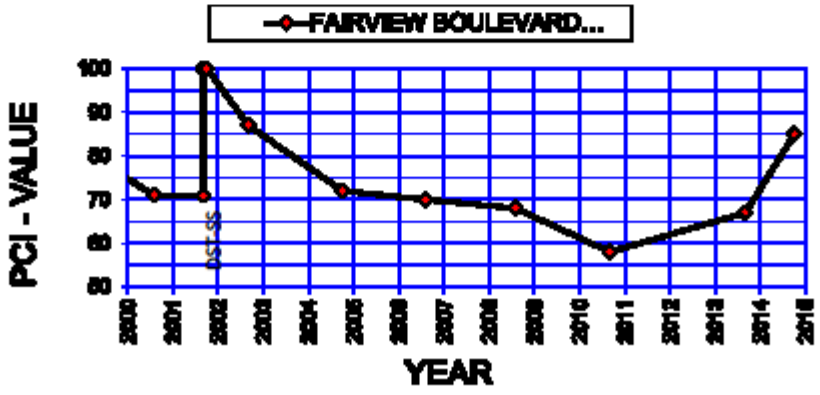
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** I0199 FAIRVIEW BOU **Section:** 2 **Surface:** STCape

L.C.D.: 7/15/1986 **Use:** ROADWA **Rank:** C **Length:** 6,223.00 (Ft) **Width:** 23.00 (Ft) **True Area:** 143,129.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
8/20/2001	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	00/01 SLURRY SEAL
7/25/1997	ST-SS	Surface Treatment - Slurry Seal		0.38	☐	96/97 SLURRY SEAL
7/15/1986	OL-AS	Overlay - AC Structural	107,065.00	2.50	☑	85/86 OVERLAY PROGRAM
9/25/1979	OL-AS	Overlay - AC Structural	93,955.00	2.50	☑	79/80 OVERLAY PROGRAM
5/15/1963	NU-IN	New Construction - Initial	0.00	3.00	☑	OLD S.R. 27 (NEED GOOD DATES &

Roadway	Fairview Boulevard	
Section	2	
Traffic Class	C - RESIDENTIAL	
PCI-before/Date	71	7-6-2000
Treatment/Year	DCS-SS	8-20-2001
PCI-final/service year	85	13
Age	13	
Asphalt Concrete Layer	Total: 8.00" 1986: 2.50" 1979: 2.50" 1963: 3.00"	



JENNIFER STREE SECTION 3

1/23/2015

Work History Report

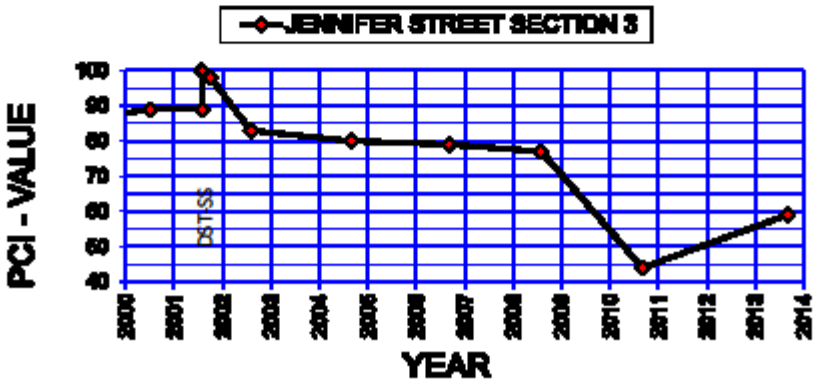
Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** I0218 JENNIFERSTRE **Section:** 3 **Surface:** STCape

L.C.D.: 8/13/1996 **Use:** ROADWA **Rank:** C **Length:** 3,536.00 (Ft) **Width:** 35.00 (Ft) **True Area:** 126,078.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
7/25/2001	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	00/01 SLURRY SEAL
8/13/1996	OL-AT	Overlay - AC Thin	0.00	2.00	☑	95/96 INCLINE OVERLAY PROGRA
8/13/1996	OL-AS	Overlay - AC Structural	0.00	2.50	☑	95/96 INCLINE OVERLAY PROGRA
8/13/1996	OL-AF	Overlay - AC Fabric	0.00	0.10	☑	95/96 INCLINE OVERLAY PROGRA
10/18/1982	OL-AS	Overlay - AC Structural	58,884.00	2.50	☑	82/83 OVERLAY PROGRAM

Roadway	Jennifer Street	
Section	3	
Traffic Class	C- RESIDENTIAL	
PCI-before/Date	89	6-9-2000
Treatment/Year	DCS-MS	7-25-2001
PCI-final/service year	59	12
Age	13	
Asphalt Concrete Layer	Total: 7.00" 1996: 2.00" 1996: 2.50" 1982: 2.50"	



RODEO CREEK ROAD SECTION 1

1/23/2015

Work History Report

Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** G0019 RODEOCREEK **Section:** 1 **Surface:** STChip

L.C.D.: 10/14/200 **Use:** ROADWA **Rank:** D **Length:** 17,323.00 (Ft) **Width:** 25.00 (Ft) **True Area:** 433,075.01 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
10/25/2001	ST-CH	Surface Treatment - Chip Seal		0.50	☐	00/01 SLURRY SEAL
10/14/2000	NU-IN	New Construction - Initial		5.50	☑	99/00 OVERLAY PROGRAM

Roadway	Rodeo Creek Road	
Section	1	
Traffic Class	D - INDUSTRIAL	
PCI-before/Date	100	10-15-2000
Treatment/Year	DCS-SS	10-25-2001
PCI-final/service year	55	13
Age	13	
Asphalt Concrete Layer	Total: 5.50" 2000: 5.50"	

RODEO CREEK ROAD SECTION 4

1/23/2015

Work History Report

Pavement Database: all14 April2014

Network: WASHOE COUNTY **Branch:** G0019 RODEOCREEK **Section:** 4 **Surface:** STCape

L.C.D.: 10/16/200 **Use:** ROADWA **Rank:** D **Length:** 5,510.00 (Ft) **Width:** 24.00 (Ft) **True Area:** 132,240.00 (SqFt)

Work Date	Work Code	Work Description	Cost	Thickness (in)	Major M&R	Comments
10/25/2001	ST-CS	Surface Treatment Double - Cape Seal		0.50	☐	00/01 SLURRY SEAL
10/16/2001	NU-IN	New Construction - Initial		5.50	☑	00/01 SLURRY SEAL

Roadway	Rodeo Creek Road	
Section	4	
Traffic Class	D - INDUSTRIAL	
PCI-before/Date	100	10-17-2001
Treatment/Year	DCS-SS	10-25-2001
PCI-final/service year	50	13
Age	13	
Asphalt Concrete Layer	Total: 5.50" 2001: 5.50"