CITY OF GUADALUPE

2019 PMP Update
Final Report
November 2019

Pavement Engineering Inc.

You can ride on our reputation

Table of Contents

Section I

Executive Summary

EXECUTIVE SUMMARY

The City of Guadalupe currently maintains approximately 19 centerline miles of roads representing 3,693,630 square feet of pavement with a replacement value of approximately $62,033,000 as calculated by StreetSaver®.

Pavement Engineering Inc. (PEI) updated all the streets in the City's Pavement Management System, using the Metropolitan Transportation Commission's (MTC) StreetSaver® program. The purpose of a Pavement Management System is to track inventory, store work history and furnish budget estimates to optimize funding for improving the city's pavement system.

INTRODUCTION

A Pavement Management System has several distinctive uses:

- As a budgeting tool, a Pavement Management System uses treatment costs that are based on recently bid projects, by the participating agency, so that budgets reflect historical costs for the area.
- As an inventory tool, a Pavement Management System provides a quick and easy reference for pavement areas and use.
- As a pavement condition record, a Pavement Management System provides age, load-related, non-load related and climate-related pavement condition and deterioration information. The Pavement Management System uses pavement deterioration curves, based on nationwide research, which allow the program to predict a pavement's future condition.

A Pavement Management System is not capable of providing detailed engineering designs for a street. The Pavement Management System instead helps the user identify candidate streets for potential repair and maintenance. Project level pavement analysis and engineering is an essential feature of future pavement maintenance and rehabilitation projects. Additional investigation, or project level analysis, can optimize the City's pavement management dollars. Project level engineering examines the pavements in significantly more detail than the visual evaluation required for the Pavement Management System Update and optimizes designs for all of the peculiar constraints of a set of project streets.

WORK PERFORMED

Pavement Distress Survey and Database Update

For this update, PEI performed inspections on approximately 19 centerline miles of road. Field inspections were completed in September 2019.

PEI measured the following distress types as part of our review: alligator cracking (fatigue), block cracking, distortions, longitudinal & transverse cracking, patching & utility cut patching, rutting / depressions, weathering, and raveling. All the collected data was entered into the City's StreetSaver® database.

As part of our field review, all the streets were measured to confirm lengths and widths. Lengths were measured using a vehicle-mounted electronic measuring device and widths were measured using a hand-held measuring wheel. Measurement discrepancies were tabulated and reviewed with the City to determine if corrections were needed.

PEI performed a quality control (QC) check on our work. PEI's QC check consists of performing a field review of any street segment where the PCI showed a decrease of 3 or more points per year, or an increase of 1 PCI without a documented M&R treatment, when compared to the last inspection for the same road segment in the StreetSaver® database. Each segment in the QC process was visually reviewed to determine if the StreetSaver® calculated PCI was representative of the observed overall pavement condition for that road segment. Variations found were re-inspected by a Senior Engineering Technician, or the Project Manager, and the segments' PCI was recalculated.

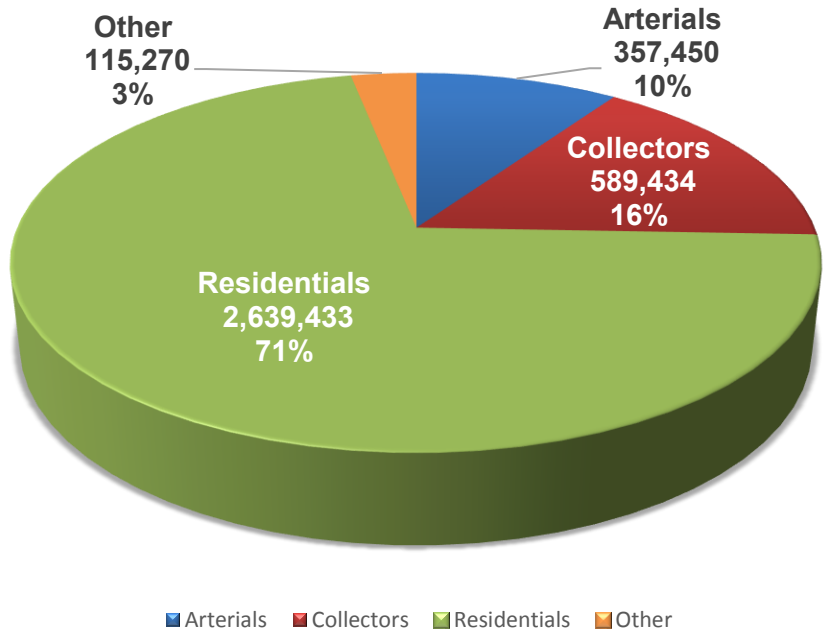
FINDINGS

The updated Pavement Management System showed that the City's overall average PCI is 79.

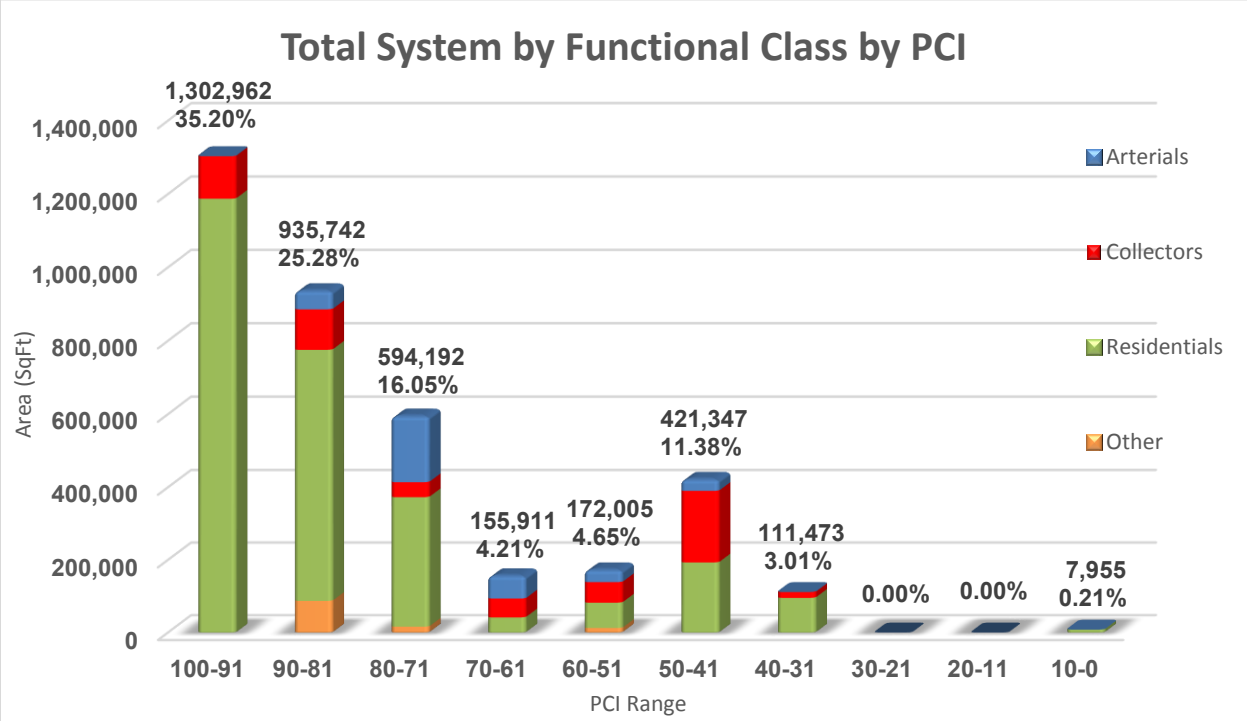
The breakdown by functional classification is as follows:

Functional Classification	Centerline Miles	Lane Miles	Pavement Area (sq. ft.)	Percent of System	Average PCI
Arterial	1.83	3.66	357,448	9.66%	71
Collector	2.73	5.46	589,434	15.92%	68
Residential	13.50	26.92	2,631,478	71.31%	82
Other	1.18	2.36	115,270	3.11%	79
Totals	19.24	38.40	3,693,630	100.00%	79

The pie graph below shows the percentage of each functional classification, by area.



The bar graph below shows the City's street system broken down into 10-point PCI ranges.



The breakdown by Condition Category and corresponding PCI range is shown below:

Condition Category Breakdown			
Condition	**PCI Range**	**% Of Total**	**Square Feet**
Excellent	100-91	35.20%	1,302,962
Good	90-71	41.33%	1,529,934
Fair	70-51	8.86%	327,916
Poor	50-31	14.39%	532,820
Failed	30-0	0.21%	7,955

The analysis shows that **76.53%** of the City's pavement are in **Excellent** to **Good** condition. Details of each street segment are provided in ***Section IV: Reference Reports***.

BUDGET ANALYSIS

StreetSaver® uses a decision tree to model the decision-making process that agencies follow to select a maintenance or rehabilitation strategy. The decision tree contains "branches" for each functional classification, surface type and condition category. Jurisdictions can outline their maintenance and rehabilitation strategy by choosing a treatment for each branch.

The treatments listed in the decision tree are generalized to provide a range of treatments. Typical treatments within each generalized treatment range are listed below. The exact treatment would need to be determined during the design phase of the project.

StreetSaver® assigns a treatment action and estimated cost to each street segment based on the pavement's current PCI.

Treatment Category	Typical Treatment
Light Maintenance	• Slurry Seal or Micro-Surface • Fog Seal or Scrub Seal
Heavy Maintenance	• Chip Seal, Cape Seal • Slurry Seal or Micro-Surface with Digouts • Thin Maintenance Overlay (TMO)
Light Rehab.	• Overlay (2" and under) or Thin Mill and Fill
Heavy Rehab.	• Overlay (greater than 2") or Thick Mill and Fill • Cold-In-Place Recycling • Full Depth Reclamation • Pulverize and Resurfacing
Reconstruct	• Full Section Reconstruction

Decision Tree Unit Prices

As a minimum, recent bid tabulations should be used to determine the appropriate unit costs. Further, the unit costs include other costs such as design, construction management, contingencies or other related construction costs (ADA ramps, curb & gutters, striping etc.) to form a more comprehensive unit cost for the selected treatments.

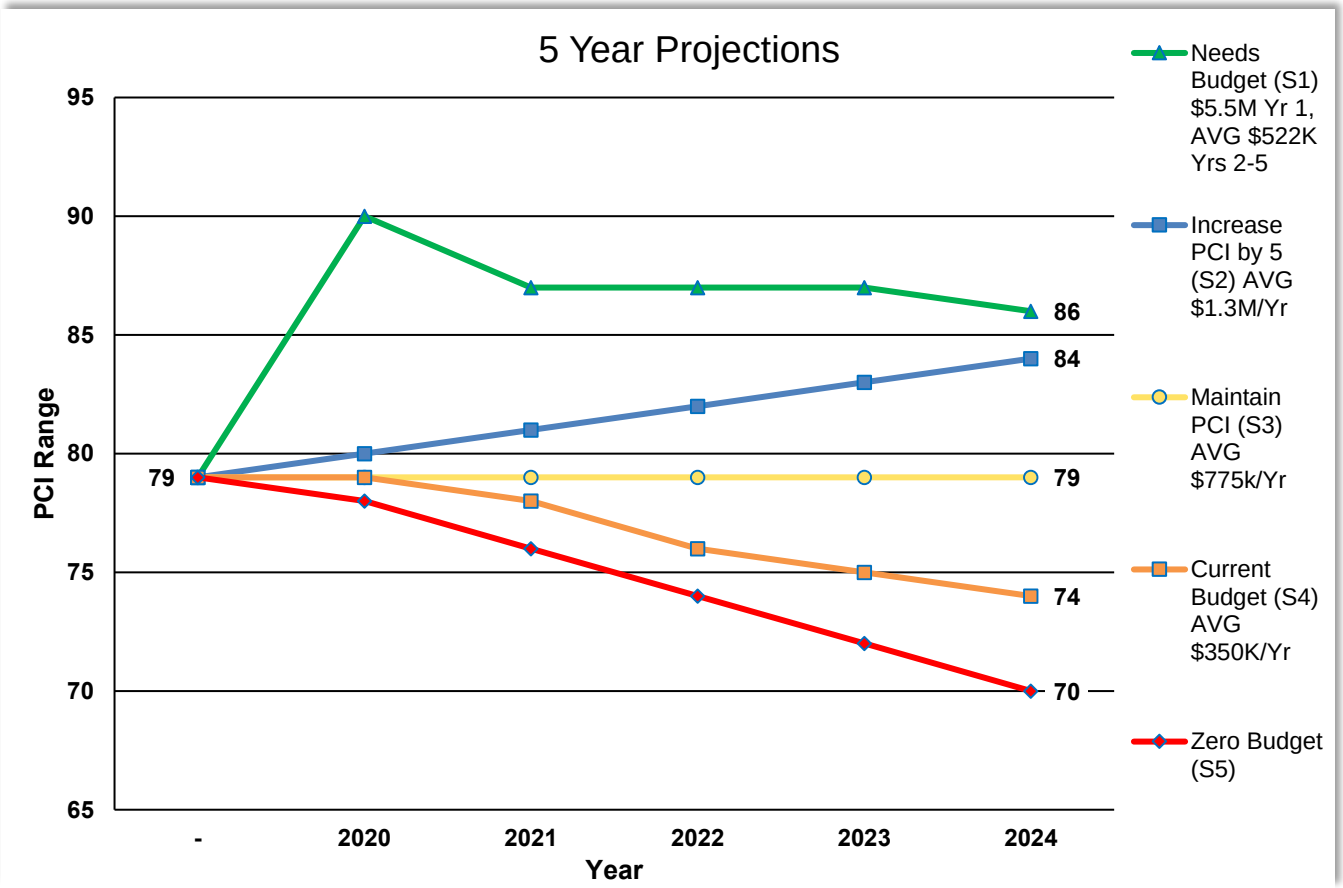
For the City of Guadalupe, the unit costs on the following table were used:

Treatment	Arterial	Collector	Residential
Cost/ Sq Yd			
Crack Seal **($$/LF)**	$1.61	$1.61	$1.61
Light Maintenance	$5.03	$5.03	$5.03
Heavy Maintenance	$27.66	$27.66	$27.66
Light Rehab	$34.56	$34.56	$34.56
Heavy Rehab	$69.13	$69.13	$69.13
Reconstruct	$225.04	$166.98	$138.14

For this update, PEI analyzed several scenarios, which are summarized below:

Budget Scenario Projections

PEI generated Five (5) scenario projections which are represented graphically below:



A summary of each of the scenario projections are as follows:

Scenario 1: Unconstrained Budget/ Funds Needed to obtain Optimum PCI ($5.5M for Year 1, $522K/Yr Avg. for Years 2-5.)

Scenario 2: Amount of funding to increase PCI by 5 (Avg. $1.3M/Yr.)

Scenario 3: Amount of funding to maintain PCI of 79 (Avg. $775K/Yr.)

Scenario 4: Impact of the current funding amount ($350K/Yr. Avg.) the current PCI would decline from 79 to 74, a 5 point overall drop.

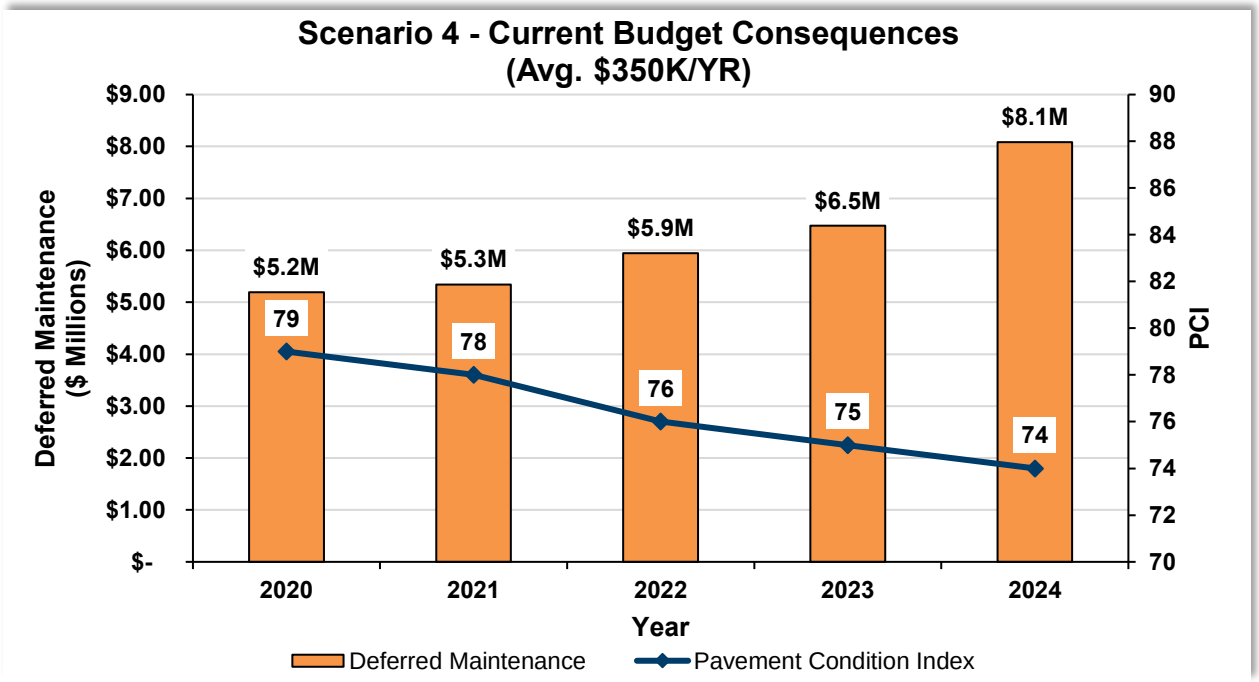
Scenario 5: Represents the impact to the PCI if Zero dollars are spent

The full report for the various budget scenarios can be found in **Appendix B**.

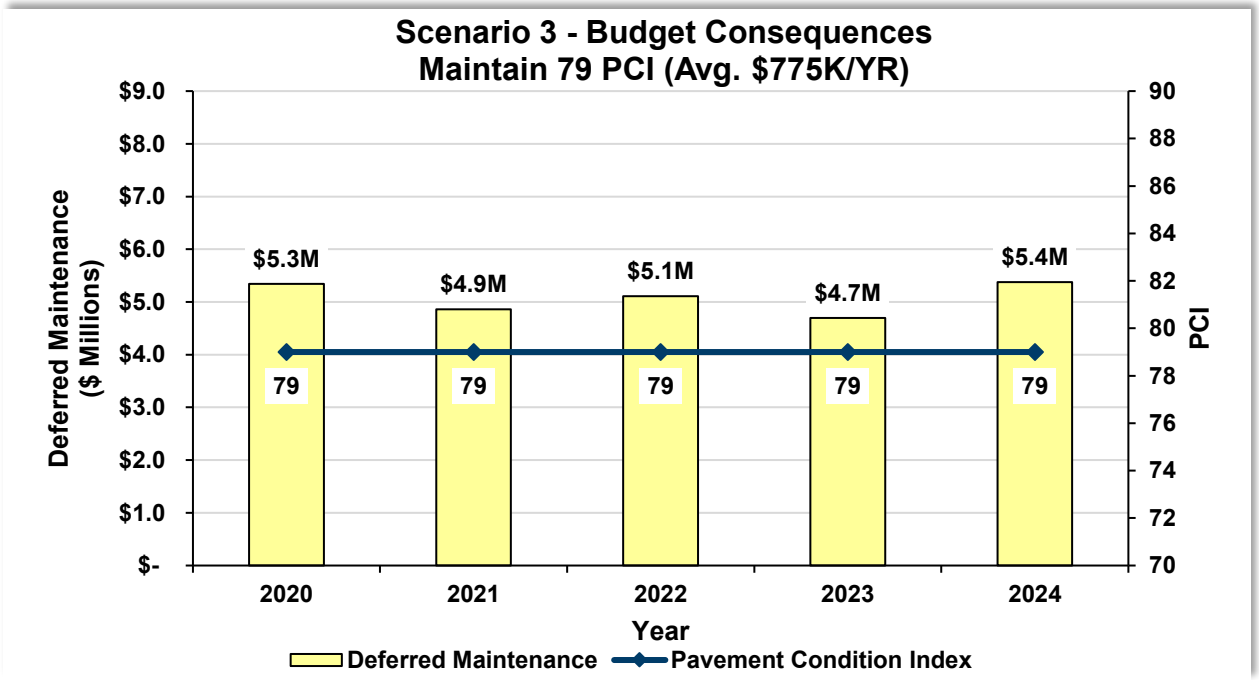
Budget Consequences

The following graphs illustrate the consequences to the City's overall weighted PCI and Deferred Maintenance Amount, based on the scenario projections:

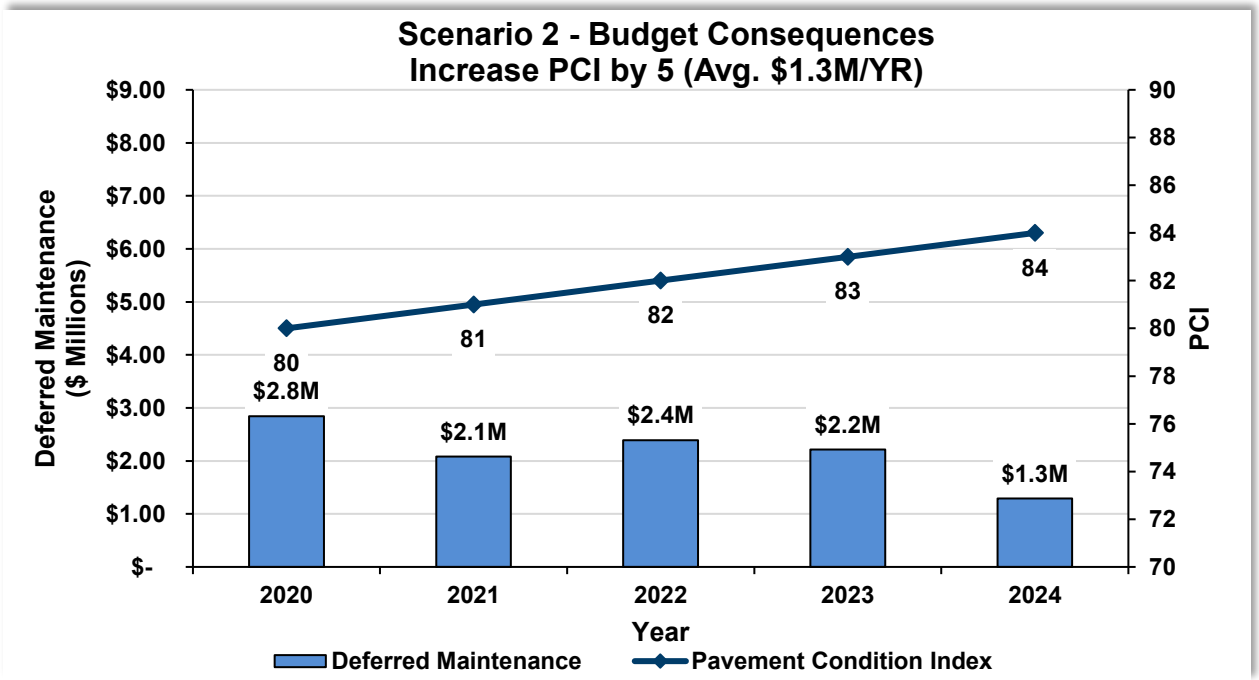
At the current funding level of $350M/Yr. Avg., the PCI of the entire system will deteriorate from 79 to 74, a 5 PCI point drop over the next 5 years. In addition, the backlog of deferred maintenance grows from $5.2 million to $8.1 million, an increase of 56%.



To maintain the current PCI of 79, it is projected that an average funding level of $775K/YR is necessary. At this funding level the backlog of deferred maintenance grows from $5.3 million to $5.4 million, an increase of 2%.



To increase the PCI 5 points from 79 to 84, it is projected that an average funding level of $1.3M/YR is necessary. At this funding level the backlog of deferred maintenance shrinks from $2.8 million to $1.3 million, a decrease of 54%.



CONCLUSIONS AND RECOMMENDATIONS

This Executive Summary provides a review of the 2019 Pavement Management System Update performed by PEI. PEI inspected all road segments in the City of Guadalupe. The average overall PCI for the City is 79. 76.53% of the City's pavement is in Excellent to Good condition.

To maintain the system at its current overall PCI of 79, the City will need to spend an average of $775K annually over the next 5 years. Maintaining the current funding level of approximately $350K/Yr annually is projected to result in a PCI loss of 5 points in 5 years to a PCI of 74.

A review of the City's street system, by functional classification, shows that the residential streets have the highest average PCI of 82, followed by the Alleys with an average PCI of 79. The arterial streets, which have an average PCI of 71, followed by collector streets, with an average of 68. As a general rule, agencies typically try to keep their arterials in the best condition because they carry the bulk of the traffic and loading, followed by collectors, then the residential/ local streets.

Moving forward, PEI recommends the City carefully evaluate the overall annual budget to determine the amount it wants to commit to pavement maintenance and rehabilitation projects. We recommend the City set priorities for each functional classification and perhaps certain streets within each classification.

This Pavement Management System will assist the City in its efforts to monitor treatments and track their effectiveness and help the City in setting future priorities and treatment policies. To ensure the city is evaluating accurate data, PEI recommends the City update its Pavement Management System on a regular basis and review entire system every three years, this includes a thorough review of the Decision Tree and the unit costs contained within. As the City maintains and updates its Pavement Management System, the program will become a valuable tool in its efforts to maximize performance and minimize the spending for pavements.

Section II

Background

BACKGROUND

This section is intended to introduce important pavement design definitions and calculations as a background for understanding the Pavement Management System (PMS) assumptions.

PAVEMENT DESIGN BASICS

Pavements are a structural support system generally considered to act like a beam. But unlike beams in buildings, which generally have static loads, the pavement structure is flexed many times from traffic loading. Cars and light trucks have little impact on the pavement structure. Larger/Heavier trucks have very significant impacts on the pavement due to the high axle weights. The impact of trucks is measured in equivalent single 18,000-pound axle loads (EALs). The total EALs are converted into a design Traffic Index (TI). As an example, a design TI of 5 is equal to 7,160 EALs. A Design TI of 8 is equal to 372,000 EALs. Therefore, the design TI is the total number of EALs that the pavement will support before it begins to fail, regardless of the passage of time. Normally for a new pavement, the EALs over a 20-year period are used. For rehabilitation procedures such as overlays, 10 years is generally used.

The other element of pavement design is the support of the beam. The support is provided by the sub-grade soils. The support value is designated by the R-value test.

Using the design TI and R-value, the pavement designer chooses various materials to construct the structural section. The most common pavement section is a thin layer of asphalt concrete over aggregate base(s). Many options are available depending on specific project requirements and conditions.

The design methods used in California is based on a 50 percent reliability. This means that the average pavement life of all pavements constructed using the design procedure will last the design life. It also means that about half will not last that long and the other half will last longer. To express this concept, a design life is often expressed in a span of years, such as 17 to 23 years for 20-year design life.

PAVEMENT DETERIORATION

Pavement deteriorates from two processes. There are **fatigue** and **aging.** The processes occur simultaneously. In a well-designed and constructed pavement, the two processes result in the need to rehabilitate the pavement at approximately the same time. This is called the design life. The design life for most new pavements is 20 years. Each aging process has its own set of pavement defects, which are related to the process.

Fatigue

The first deterioration process is fatigue from heavy axle loads. As the pavement structure flexes or bends from heavy wheel loads, the asphalt concrete layer's ability to flex is consumed. With enough bending, the asphalt concrete layer begins to break at the bottom. These cracks progress upward until they reach the surface and appear as alligator cracking. These areas are repaired by removal and replacement of the asphalt concrete in the affected areas. These repairs are commonly called digouts.

As the pavement structure, its supporting soils, and the precise loading from wheel loads vary, so does the time it takes for alligator cracking to appear. As alligator cracking appears, the pavement is repaired with digouts. Generally, when total cumulative quantity of digouts reaches approximately 10 percent, or more, of the total area, the pavement is considered to have reached its service life and requires major rehabilitation.

Aging

The major element of the pavement structure that ages is the asphalt concrete layer. To a minor extent, aggregate bases can age if contaminated by fine soil particles, which are transported from the subsoil into the aggregate base.

Asphalt concrete is composed of aggregates and asphalt cement. The aggregates used are generally of fair quality and do experience some breakdown over time. Aggregate aging problems need to be addressed in maintenance procedures. The asphalt concrete binder ages as well. As the asphalt binder ages, it loses volume through the loss of volatile components in the asphalt. As the volume decreases, the pavement will progressively crack from the resulting tensile strain in the layer. Normally, these cracks first show up as transverse cracks. They also show up in weak areas, such as paving joints. These cracks widen and increase over time until the pavement has a checkerboard appearance.

The aging process also causes the pavement to become more brittle. The increased stiffness results in additional cracking from loaded vehicles. This load induced cracking from the brittleness of the asphalt concrete is very similar to fatigue cracking in appearance.

The major agent for deterioration of the asphalt concrete binder is oxygen. The carrier of the oxygen is water. Water enters the pavement either from the surface or as water vapor from underneath.

TYPICAL PAVEMENT DEFECTS

StreetSaver® identifies eight different Asphalt Concrete distress types. These are:

1. Alligator Cracking (Fatigue)
2. Block Cracking
3. Distortions
4. Longitudinal and Transverse Cracking
5. Patching and Utility Cut Patching
6. Rutting and Depression
7. Raveling
8. Weathering

These defects are common to virtually the entire pavement as aging progresses.

Age cracking begins with longitudinal and transverse cracking and progresses to block shrinkage cracking.

For purposes of understanding the levels of these distresses, the condition level descriptions from the rating manual are included herein:

Alligator Cracking (Fatigue)

Description:

Alligator or fatigue cracking is a series of interconnecting cracks caused by fatigue failure of the asphalt concrete surface under repeated traffic loading. Cracking begins at the bottom of the asphalt surface (or stabilized base) where tensile stress and strain are highest under wheel load. The cracks propagate to the surface initially as a series of parallel longitudinal cracks. After repeated traffic loading, the cracks connect, forming many sided, sharp-angled pieces that develop a pattern resembling chicken wire or the skin of an alligator. The pieces are generally less than 0.6 m (2 ft) on the longest side. Alligator cracking occurs only in areas subjected to repeated traffic loading, such as wheel paths. Therefore, it would not occur over an entire area unless the entire area were subject to traffic loading (pattern-type cracking that occurs over an entire area not subjected to loading is called “block cracking,” which is not a load-associated distress).

Severity Levels:

L Fine, longitudinal hairline cracks running parallel to each other with no, or only a few interconnecting cracks. The cracks are not spalled.

M Further development of light alligator cracks into a pattern or network of cracks that may be lightly spalled.

H Network or pattern cracking has progressed so that the pieces are well defined and spalled at the edges. Some of the pieces may rock under traffic.

Block Cracking

Description:

Block cracks are interconnected cracks that divide the pavement into approximately rectangular pieces. The blocks may range in size from approximately 0.3 by 0.3 m (1 by 1 ft) to 3 by 3 m (10 by 10 ft). Block cracking is caused mainly by shrinkage of the asphalt concrete and daily temperature cycling (which results in daily stress/strain cycling). It is not load-associated. Block cracking usually indicates that the asphalt has hardened significantly. Block cracking normally occurs over a large portion of the pavement area, but sometimes will occur only in non-traffic areas. This type of distress differs from alligator cracking in that alligator cracks form smaller, many-sided pieces with sharp angles. Also, unlike block cracks, alligator cracks are caused by repeated traffic loadings and therefore found only in traffic areas (i.e., wheel paths).

Severity Levels: (*See definitions of longitudinal transverse cracking.)

L Blocks are defined by low-severity* cracks.

M Blocks are defined by medium-severity* cracks.

H Blocks are defined by high-severity* cracks.

Distortions

Description:

Distortions are usually caused by corrugations, bumps, sags and shoving. They are localized abrupt upward or downward displacements in the pavement surface, a series of closely spaced ridges and valley or localized longitudinal displacements of the pavement surface. Distortions affect ride quality.

Severity Levels:

L Distortion produces vehicle vibrations, which are noticeable, but no reduction in speed is necessary for comfort or safety and/or individual distortions cause the vehicle to bounce slightly but create little discomfort.

M Distortion produces vehicle vibrations, which are significant, and some reduction in speed is necessary for safety and comfort.

H Distortion produces vehicle vibrations, which are so excessive that speed must be reduced considerably for safety and comfort.

Longitudinal and Transverse Cracking (Non-PCC Slab Joint Reflective)

Description:

Longitudinal cracks are parallel to the pavement's centerline or laydown direction. They may be caused by:

1. A poorly constructed paving lane joint.
2. Shrinkage of the AC surface due to low temperature or hardening of the asphalt and/or daily temperature cycling.
3. A reflective crack caused by cracking beneath the surface course, including crack in PCC slabs.
4. Decreased support or thickness near the edge of the pavement.

Transverse cracks extend across the pavement at approximately right angles to the pavement centerline or direction of laydown. These may be caused by conditions (2) and (3) above. These types of cracks are not usually load-associated.

Severity Levels:

L One of the following conditions exists:
- (1) non-filling crack width is less than 10 mm (3/8 in.) or
- (2) filled crack of any width (filler in satisfactory condition).

M One of the following conditions exists:
- (1) non-filled crack width is greater than or equal to 10 mm and less than 75 mm (3/8 to 3 in.)
- (2) non-filled crack is less than or equal to 75 mm (3 in.) surrounded by light and random cracking, or
- (3) filled crack is of any width surrounded by light random cracking.

H One of the following conditions exists:
(1) any crack filled or non-filled surrounded by medium or high severity random cracking,
(2) non-filled crack greater than 75 mm (3 in.) or
(3) A crack of any width where approximately 100 mm (4 in.) of pavement around the crack is severely broken.

Patching and Utility Cut Patching

Description:

A patch is an area of pavement that has been replaced with new material to repair the existing pavement. A patch is considered a defect no matter how well it is performed (a patched area or adjacent area usually does not perform as well as an original pavement section). Generally, some roughness is associated with this distress.

Severity Levels:

L Patch is in good condition and satisfactory. Ride quality* is rated as low severity or better.

M Patch is moderately deteriorated and/or ride quality* is rated as medium severity.

H Patch is badly deteriorated and/or ride quality* is rated as high severity. Needs replacement soon.

*Ride quality is defined in the severity levels of distortions.

Rutting and Depressions

Description:

A rut is a surface depression in the wheel paths. Pavement uplift may occur along the sides of the rut, but in many instances, ruts are noticeable only after a rainfall when the paths are filled with water. Rutting stems from a permanent deformation in any of the pavement layers or sub-grades, usually caused by consolidated or lateral movement of the materials due to traffic load. Significant rutting can lead to major structural failure of the pavement.

Depressions are localized areas where the pavement structure is lower than the surrounding area, but the transition is not abrupt enough to be considered a distortion. They are often referred to as “bird baths”.

Severity Levels: (Average Rut or Depression Depth)

L 1/2" to less than 1” (13 to 25mm).

M 1” to less than 2” (25 to 50mm).

H equal to or greater than 2” (over 50mm).

Raveling

Description:

Raveling is the dislodging of coarse aggregate particles. Raveling may be caused by insufficient asphalt binder, poor mixture quality, insufficient compaction, segregation, or stripping.

Coarse aggregate refers to the predominant coarse aggregate size of the asphalt mix, and aggregate clusters refers to when more than one adjoining coarse aggregate piece is missing. If in doubt about a severity level, three representative areas of one square yard each (square meter) should be examined and the number of missing aggregate particles/clusters is counted.

Severity Levels:

M Considerable loss of coarse aggregate greater than 20 per square yard (square meter), and/ or clusters of missing coarse aggregate are present.

H Surface is rough and pitted, and it may be completely removed in places.

Weathering

Description:

Weathering is the wearing away of the asphalt binder and fine aggregate matrix.

Coarse aggregate refers to predominant coarse aggregate size of the asphalt mix. Loss or dislodging of coarse aggregate is covered under Raveling. Surface wear is normally caused by oxidation, inadequate compaction, insufficient asphalt content, excessive natural sand, surface water erosion, and traffic. Weathering occurs faster in areas with high solar radiation.

Severity Levels:

L Asphalt surface beginning to show signs of aging which may be accelerated by climatic conditions loss of fine aggregate mix is noticeable and may be accompanied by fading of the asphalt color. Edges of the aggregates are beginning to be exposed (less than 0.05 inches or 1 mm).

M Loss of the fine aggregate matrix is noticeable and the edges of the coarse aggregate have been exposed up to 1/4th of the width (of the longest side) of the coarse aggregate due to the loss of fine aggregate matrix.

H Edges of the coarse aggregate have been exposed greater than 1/4th of the width (of the longest side) of the coarse aggregate. There is considerable loss of fine aggregate matrix leading to potential or some loss of coarse aggregate.

PAVEMENT MAINTENANCE PROCEDURES

Pavement maintenance procedures are designed to slow the pavement aging process. Mainly, the procedures are designed to protect the pavement from the adverse effects of water and to some extent vehicle traffic.

Maintenance procedures, which protect the pavement from aging, are crack sealing, digouts, slurry seals, and cape seals. When pavements have extensive cracking and are beyond their design life, interim holding measures including skin patches and thin overlays are used as a stop gap prior to major rehabilitation.

The following outlines some of the more common types of maintenance procedures:

Crack Sealing

Crack sealing prevents surface water from getting beneath the asphalt concrete layer into the aggregate bases. Crack sealing is generally performed using hot rubberized crack sealing material. The procedure includes routing small cracks, cleaning and sealing.

Digouts

Digouts are small areas of deteriorated pavements, which are removed and replaced with new asphalt concrete. Pavement removal is accomplished by cold planning or saw cutting and excavation. New asphalt is installed in at least two lifts. The digout depth is determined depending on the street type and construction.

Slurry Seals

Slurry seals consist of a combination of fine aggregate and emulsified oil. A new type of slurry seal called Rubberized Asphalt Slurry (RAS) is in the development stage. Currently, the cost of RAS is 2 to 3 times as much as a conventional slurry seal, which makes the product economically unattractive. Slurry seals are used when the existing pavement surface is severely raveled.

Cape Seals

Cape seals consist of a chip seal over coated with a slurry seal. A chip seal is an application of small angular rock (chips) approximately 1/4" to 3/8” in a maximum size embedded into a thick application of asphalt emulsion. Most chip seals incorporate polymer modified binders.

Cape seals are used on residential and collector streets to maintain a pavement, which may need an overlay, but there are not sufficient funds available. Chip seals are placed over low to moderate alligator cracks and block shrinkage cracking. Due to the distress covered by the chip seal, small areas of disbanding or failure may occur and will require patching.

Cape sealed surfaces are fairly coarse compared to new paving. Due to this characteristic, they may not be acceptable to some segments of the public.

Interim Holding Measures (or “Stop Gap” in StreetSaver® Terms)

Interim holding measures or stop gap treatments are used to “hold” the pavement together until funds become available for major rehabilitation. The common holding measures used by City include skin patches and thin overlays.

Skin patches are thin lifts of fine asphalt concrete placed over deteriorated areas.

Thin maintenance overlays are placed to hold the surface together. The asphalt concrete layer is generally 1 to 1-1/2 inches thick. A 3/8 inch aggregate is used with a Terminally Blended Asphalt Rubber Binder.

PAVEMENT REHABILITATION PROCEDURES

Pavement rehabilitation consists of procedures used to restore the existing pavement quality or to add additional structural support to the pavement. Rehabilitation procedures include conventional overlays; pulverization and resurfacing; ARHM (asphalt rubber hot mix) overlays; AC removal and replacement (Mill and Fill); and reconstruction.

The following outlines some of the more common types of rehabilitation procedures:

Conventional Overlays

Conventional overlays generally consist of surface preparation, pavement fabric and varying thicknesses of asphalt concrete. Surface preparation can consist of crack filling, pavement repairs of base failures and leveling courses.

Pavement fabric is often used as a water inhibiting membrane and to retard reflective cracking. Care must be used with fabric to avoid intersections with heavy truck breaking, steep grades (generally over 8 percent), and areas where subsurface water might be trapped.

The overlay thickness is determined by the structural requirement of the deflection analysis and reflective cracking criteria. The reflective cracking criteria requires the thickness of the overlay to be a minimum 1/2 the thickness of the existing bonded layers. Pavement fabric can account for 0.10 ft of asphalt for reflective cracking criteria if the structural requirements from the deflection analysis are met.

Conventional overlays have an expected service life of 7 to 13 years if they are designed to meet structural and reflective cracking criteria and are well constructed.

Pulverization and Resurfacing

Pulverization and resurfacing is an alternative to conventional overlays for streets that are structurally adequate but exhibit sufficient cracking to warrant improvement to the asphalt surface.

Pulverization and resurfacing are an intermediate step between overlays and reconstruction. The existing asphalt concrete is recycled into aggregate base and the recycled base increases the total structural section. The surface is re-graded to conform to flush facilities similar to the way the pavement is keycut for overlays. The re-grading allows for some improvement to the cross section and profile. This method eliminates the stress history and cracking of the old asphalt concrete pavement, thus eliminating negative impacts on the new asphalt concrete surface.

Some instability can be encountered when the pulverization method is used. PEI typically recommends budgeting 5 to 10 percent of the pulverized sub-grade area for stabilization. Stabilization can be performed using 6-inch deep lift asphalt concrete.

Pulverization and resurfacing has a life expectancy of 13 to 18 years. The life expectancy is slightly less than full reconstruction because some residual deficiencies in thickness or quality of the unaffected layers may still exist. Additional testing is necessary to determine if pulverization is a viable alternative. This testing includes measuring the existing structural section and testing the native soil for bearing capacity (R-value).

RHMA Overlays

RHMA is the shortened reference for Rubberized Hot Mix Asphalt. This new material uses crumb rubber mixed with traditional asphalt binders to produce a more flexible paving material than conventional dense graded hot mix asphalt (HMA).

Caltrans has developed design criteria for use of this material based on accelerated performance testing using its dual wheel accelerated pavement testing equipment. The Caltrans criteria allows RHMA to be used in a one to two ratio to conventional hot mix asphalt. Thus 1 inch of RHMA is equal to two inches of conventional hot mix asphalt. This is true for both structural and reflective cracking criteria.

RHMA costs approximately 1-3/4 times as much as conventional asphalt and provides a similar service life to that of conventional hot mix asphalt, 7 to 13 years. RHMA is generally only feasible when vertical constraints such as curb and gutter restrict the thickness of the overlay. RHMA typically has more open surface than conventional hot mix asphalt and is more difficult to obtain a high quality finished product.

AC Removal and Replacement (Mill and Fill)

On some thick asphalt concrete pavements, the most economical approach to rehabilitating the pavement is to remove some of the existing asphalt concrete surface, which matches the existing profile. The replacement material can be either conventional hot mix asphalt (HMA) or RHMA, depending on the design criteria.

In other cases, due to drainage or other physical constraints, additional thickness cannot be placed. If the underlying base is sufficient to support anticipated loading, the asphalt layer can be removed and replaced. Depending on existing conditions, this method should have a life of 15 to 20 years.

Reconstruction

When the pavement has severe cross section deficiencies or requires significant structural strengthening, reconstruction may be the only alternative. Generally, existing pavement materials are recycled and incorporated into the new pavement structure. Structural section material alternatives include treated soils, full depth asphalt concrete, recycled materials and Portland cement concrete.

Section III

Pavement Management System Specifics

PAVEMENT MANAGEMENT SYSTEM SPECIFICS

This section discusses the characteristics of the Pavement Management System and its application for The City of Guadalupe.

BACKGROUND (STREETSAVER®)

During the early years of Pavement Management software development, many companies developed private software packages focused on management of municipal street systems. Though these programs were versatile and sophisticated, the user was also dependent upon the software vendor for training, program updates, and software servicing. Many of the vendors had difficulty maintaining their software, leaving agencies stranded after making a substantial investment.

In 1982, the Metropolitan Transportation Commission (MTC) completed a study of local road and street maintenance needs and revenue short falls in the San Francisco Bay Area. The results of the study indicated that local jurisdictions were spending only 60 percent of funds required to maintain roads in a condition considered adequate. This indicated a need to improve pavement maintenance and rehabilitation techniques and practices. A committee was formed to evaluate pavement management efforts. At approximately the same time, six public works directors reviewed a proposal to develop a prototype Pavement Management System (PMS); however, it was felt that the proposed system was too complex. This group strongly emphasized that simplicity was the most important objective to be developed in a PMS if it was to be adopted and used by cities and counties.

In 1983, a consultant was retained to assist MTC in determining PMS needs, PMS resources, and problems. In addition, they were to develop three basic elements of a standardized prototype PMS: a pavement condition index (PCI), effective maintenance treatments for the Bay Area, and a network level assignment procedure. The result was the first version of the MTC PMS. Since that time the program has evolved into StreetSaver®.

Today, the Metropolitan Transportation Commission (MTC) for California's San Francisco Bay Area uses StreetSaver® to help local cities and counties better allocate resources, predict the future condition of their pavements at different levels of funding, and demonstrate the effects of underfunded road programs. The Bay Area was one of the first regions in the country to implement a pavement management system that is used by nearly all of its localities. Using StreetSaver®, cities and counties can plan and manage road improvement projects, document budget needs and shortfalls, and use the collected data to build support for additional transportation funding.

StreetSaver® manages a collection of related data organized for easy storage and retrieval. The StreetSaver® program includes a database comprised of several sets of related data ("tables") that contain information about the street network in the jurisdiction. This information includes pavement condition, the available maintenance/rehabilitation treatments and their costs, and the history of the network. Based on this information, budget analyses are performed. A budget analysis allows the user to project network maintenance and rehabilitation needs, and costs to evaluate the consequences of various budget allocation alternatives. Alternatives can be evaluated in terms of maintenance and rehabilitation that can actually be performed, future pavement condition, and deferred costs. For some agencies, use of the StreetSaver® program is cyclical. For others, pavement management is integrated into an ongoing effort to manage their street networks.

Implementation

There are several steps involved in implementing an effective Pavement Management System. These tasks should be completed on a periodic basis. These tasks include:

1. Collect pavement condition and maintenance/rehabilitation data.
2. Enter re-inspection data and/or applied maintenance and rehabilitation information.
3. Check/update maintenance treatment definitions and pavement category definitions.
4. Calculate Pavement Condition Index (PCI)
5. Evaluate system and current Maintenance/Rehabilitation strategies. Determine Budget needs and if necessary develop alternate Budget Summaries.
6. Present analysis outputs to funding bodies.
7. Acquire funds and apply maintenance/rehabilitation treatments.

SYSTEM ASSUMPTIONS

The goal of the Pavement Management System is to furnish budgetary amounts in order to achieve system wide improvements in the overall pavement condition. The goal of project engineering is to obtain the maximum economical affect for a given subset of the system to be maintained. Using the Pavement Management System, management is able to realistically budget for economically maintaining The City's pavement system. Annually updating maintenance activity and costs keeps the system current.

PAVEMENT MAINTENANCE AND REHABILITATION (M&R) UNIT COSTS

The reliability and accuracy of any PMS is based on the information contained in its Decision Tree. The listed treatments in the Decision Tree are generalized to provide a range of treatments. The exact treatment would need to be determined during the design phase of a project.

Typical treatments within each generalized treatment range are listed below.

Treatment Category	Typical Treatment
Light Maintenance	• Slurry Seal or Micro-Surface • Fog Seal or Scrub Seal
Heavy Maintenance	• Chip Seal, Cape Seal • Slurry Seal or Micro-Surface with Digouts • Thin Maintenance Overlay (TMO)
Light Rehab.	• Overlay (2" and under) or Thin Mill and Fill
Heavy Rehab.	• Overlay (greater than 2") or Thick Mill and Fill • Cold-In-Place Recycling • Full Depth Reclamation • Pulverize and Resurfacing
Reconstruct	• Full Section Reconstruction

Based on a street segment's current PCI condition, StreetSaver® assigns a treatment action and estimated cost to perform the suggested treatment. This cost is not just what is paid to the contractor but should include all the "Soft Costs" incurred by The City.

Soft Costs can include the surface preparation, engineering cost, materials testing, and construction inspection. Even if these tasks are done "in-house", the inclusion in combination with the construction costs will tend to show the "true picture" of the cost of a specific project.

The following costs were used to develop the indicated budget numbers for each street segment PEI reviewed. The costs include miscellaneous work such as transitions, striping, dig outs, etc.

The costs are averages. Small systems will have higher unit costs and large systems will have lower unit costs. The larger the annual project size, the better the economies of scale. Timing is also important. Bidding the work in early spring will result in significantly lower prices than bids solicited in the late summer or fall. If small packages are used, costs could be 25 to 50 percent higher.

The unit costs include a 10% increase to account for potential PCC repairs that may be triggered by applying a maintenance or rehabilitation treatment to a street section. The unit costs also include a 15% allowance to account for engineering design fees and inspection. As well as a 10% contingency. These prices are in today's dollars (2018) and do not account for inflation.

TREATMENT	ARTERIAL	COLLECTOR	RESIDENTIAL
Cost/ Sq Yd			
Crack Seal ($$/LF)	$1.61	$1.61	$1.61
Light Maintenance	$5.03	$5.03	$5.03
Heavy Maintenance	$27.66	$27.66	$27.66
Light Rehab.	$34.56	$34.56	$34.56
Heavy Rehab.	$69.13	$69.13	$69.13
Reconstruct	$225.04	$166.98	$138.14

Decision Trees / Treatment Strategies

The Decision Trees are broken down into two main areas; Preventive Maintenance (PM) and Rehabilitation. StreetSaver® makes preventive maintenance a top priority. The longer a segment can be kept in good condition the lower the overall cost of its treatments. Preventive Maintenance addresses the sections that have a PCI of 71 and greater. This area is further broken down to specific treatments that could be better termed as Crack Sealing, Surface Treating and Restoration Treatments.

The Decision Tree allows the user to program these treatments on a cyclical basis. As part of this cyclical process, once a road has reached the point where it can no longer be maintained by a crack seal or a surface seal the program will shift to a Restoration Treatment. The program uses this treatment to restore the pavement in long term budgeting scenarios to the Very Good category.

The Decision Tree for Preventive Maintenance and Rehabilitation was reviewed with The City of Guadalupe and updated by PEI. The decision tree customizes the logic for how and what maintenance and rehabilitation treatments StreetSaver® selects.

Five general pavement treatment categories were used to account for the various treatments in the decision tree: reconstruction, heavy overlays, light overlays, heavy maintenance, light maintenance and no action. Specifying a general treatment category allows the user to stay focused on a budget level analysis rather than moving to a project level analysis.

The PMS software assumes average construction and material quality. Pavement life is very sensitive to materials and workmanship quality. Poor quality new construction may result in up to a 50 percent loss in the pavement life. In other words, poor quality new construction may last 10 to 15 years, whereas excellent quality construction may last 20 to 30 years. Investing in quality, both in design and construction, provides significant returns in extended pavement life resulting in lowered annual maintenance costs.

The Decision Tree for The City of Guadalupe can be found in **Appendix A** of this report.

ANNUAL PAVEMENT MAINTENANCE / REHABILITATION PROGRAM

The PCI range of 0 to 100 is broken down into five condition categories for budget calculation purposes. StreetSaver® default PCI breakpoints were used during the update of The City of Guadalupe's Pavement Management System.

The breakpoints are as follows:

PCI BREAKPOINTS

	Arterials	Collectors	Residential
100	I	I	I
90	LIGHT MAINTENANCE	LIGHT MAINTENANCE	LIGHT MAINTENANCE
70	II (Non-Load) / III (Load)	II (Non-Load) / III (Load)	II (Non-Load) / III (Load)
	HEAVY MAINT. / LIGHT REHAB.	HEAVY MAINT. / LIGHT REHAB.	HEAVY MAINT. / LIGHT REHAB.
50	IV	IV	IV
	HEAVY REHAB.	HEAVY REHAB.	HEAVY REHAB.
25	V	V	V
0	RECONSTRUCT	RECONSTRUCT	RECONSTRUCT

When a pavement section is identified for maintenance or rehabilitation, a user defined network-level cost category for a pavement of that functional class, type and condition is used to determine the needed funds for that section. For sections falling within the preventive maintenance category, or category one (1), a time sequence is used to identify the appropriate treatment and cost.

For those sections falling into a rehabilitation category, or categories two (2), three (3), four (4), or five (5), the PCI is used to determine the repair category for a pavement section.

The repair category is combined with functional classification (as a surrogate for traffic index) and surface type (as a surrogate for structural adequacy) to identify the appropriate treatment and cost. The treatment and cost identified for the section is a network-level budget planning treatment and is generally considered as a cost category for budgeting purposes rather than an actual treatment. Some sections will require more money than

estimated, some will require less. A project-level analysis is used to determine the actual treatment to be used for a given section based on condition, structural capacity and other factors.

The funding needs are summed for all sections needing work for each year of the analysis period to determine the annual budget needs. The needs analysis provides a list of sections needing work over the selected analysis period and an estimate of the funds needed. In StreetSaver®, this analysis period is 5 years. It identifies maintenance and rehabilitation needs without considering funding constraints, i.e. the Needs Analysis is unconstrained by the available budget. StreetSaver® identifies candidate sections and funds needed to provide the level of service to meet agency-defined goals.

When an agency has a considerable backlog of maintenance and repair needs, the first-year needs will include the bulk of sections needing work. From a funding standpoint, this may appear unrealistic; however, the needs analysis is only the first step in planning and programming. The information from the needs analysis is generally best presented to management as the total 5 year needs or the average needs per year of the 5-year period. Few agencies will be able to meet the first year needs as developed by the program.

The StreetSaver® Needs Analysis provides information on the condition of the network over the analysis period with and without application of the treatments. Since the application of treatments assume no limit on funds, this can be considered the upper limit of condition that could be reached by the agency and the condition without treatment can be considered the lower limit.

StreetSaver® uses a ranking process based on cost-effectiveness concepts. Basically, the longer a pavement is in good condition, the more benefit the user gets from the pavement. This can be approximated by the area under the PCI vs Time curve.

The larger that area, the longer the pavement provides the desired level of service. That area is divided by annualized costs per unit area. This ratio is weighted for different usage so that arterial streets are selected for repair before collectors in the same condition, which are selected for repair before residential/locals in the same condition. Sections of pavements that provide the best service for the least money are then selected as those that should be repaired first. StreetSaver® provides a ranked listing based on this cost-effectiveness analysis. StreetSaver® also shows the condition with and without treatment, the estimated costs for each section, the calculations used to determine the ranking, and a listing of sections not recommended for treatment.

VISUAL EVALUATIONS

PEI's technical staff evaluated all of the pavements. The streets were rated based on the StreetSaver® system described in the Background. Once the data was entered into the program, PEI completed a quality assurance review of the system and verified the results in the field. The street inventory was based on visual evaluations.

SYSTEM UPDATES

The Pavement Management System is a dynamic program. It is expected that The City will continue to visually rate the street network and update the database at least every three years. In addition to the visual review, The City should update the database by adding new streets incorporated into The City as well as new maintenance and rehabilitation work performed to any particular street segment.

Section IV
Reference Reports

Street List Alphabetical

City of Guadalupe
Desktop Reference Alphabetical

Street Name	Section ID	From	To	PCI	Length	Functional Class
ALLEY N/O 4TH ST - ALLEY1	010	OBISPO ST	END	72	371	O
ALLEY N/O 4TH ST #2 - ALLEY2	010	OBISPO ST	END	60	372	O
ALLEY N/O 7TH ST - ALLEY3	010	HWY 1/GUADALUPE ST	RUBIO ST	55	150	O
ALLEY S/O 5TH ST - ALLEY4	010	ALLEY W/O HWY 1	CAMPODONICO AVE	85	171	O
ALLEY W/O CAMPODONICO AVE - ALLEY5	010	N END	5TH ST	82	385	O
ALLEY W/O CAMPODONICO AVE - ALLEY5	020	5TH ST	3RD ST	83	975	O
ALLEY W/O CAMPODONICO AVE - ALLEY5	030	3RD ST	2ND ST	83	975	O
ALLEY W/O HWY 1 - ALLEY6	010	RUBIO ST	6TH ST	83	316	O
ALLEY W/O HWY 1 - ALLEY6	020	6TH ST	5TH ST	83	316	O
ALLEY W/O HWY 1 - ALLEY6	030	5TH ST	2ND ST	83	1968	O
ALLEY W/O OBISPO ST - ALLEY7	010	ALLEY N/O 4TH ST #2	FENCE S/O ALLEY N/O 4TH ST	74	230	O
ALMAGUER ST - ALMAG	010	PIONEER ST	NELSON DR	37	1089	R
AMBER ST - AMBER	010	FLOWER AVE	OBISPO ST	95	991	R
ARROYO SECO RD - ARROYOS	010	BUENA VISTA DR	JAMALA DR	95	550	R
AVOCET CIR - AVOCIR	010	SURF BIRD LN	S. END	87	215	R
BIRCH ST - BIRCH	010	FLOWER AVE	OBISPO ST	95	981	R
BLUE HERON CI - BLUHERC	010	END	BLUE HERON LN	85	112	R
BLUE HERON LN - BLUHERL	010	PACIFIC DUNES WAY	SURFBIRD LN	85	608	R
BUENA VISTA RD - BUENA	010	ARROYO SECO RD	LAS FLORES DR	95	2300	R
CALLE CESAR E. CHAVEZ ST - CACECH	010	RIVERVIEW ENTRANCE	W MAIN ST	95	1148	R
CAMP LN - CAMPLN	010	END	HERNADEZ DR	63	508	R
CAMPONDONICO AVE - CAMPON	010	7TH ST	5TH ST	63	651	R
CAMPONDONICO AVE - CAMPON	020	5TH ST	3RD ST	83	1050	R
CAMPONDONICO AVE - CAMPON	030	3RD ST	2ND ST	83	924	R
CARLIN DR - CARLIN	010	PAGALING DR	MAHONEY LN	54	890	R
CARRASCO DR - CARRDR	010	HACIENDA DR	LA JOYA DR	95	103	R
CASTILLO DR - CASTILLO	010	FUENTE DR	LAS FLORES DR	95	630	R
CEDAR ST - CEDAR	010	FLOWER AVE	OBISPO ST	95	991	R
CHAPMAN DR - CHAPMA	010	PIONEER ST	PAGALING DR	43	904	R
DEGASPARIS ST - DEGASP	010	5TH ST	GARRET ST	57	208	R
DEL MAR DR - DELMAR	010	OBISPO ST	LAS FLORES DR	95	835	R
EGRET LN - EGRET	010	END	SURFBIRD LN	85	279	R
EGRET LN - EGRET	020	SURFBIRD LN	SANDPIPER LN	85	617	R
EIGHTH ST - EIGHTH	010	HWY 1/GUADALUPE ST	PIONEER ST	80	320	R
ELEVENTH ST - ELVNTH	010	CITY LIMIT/SIMAS	GULARTE LN	83	1855	A
ELEVENTH ST - ELVNTH	020	GULARTE LN	OBISPO ST	80	1573	A
ELEVENTH ST - ELVNTH	030	OBISPO ST	HWY /GUADALUPE ST	72	1115	A
ELEVENTH ST - ELVNTH	040	HWY 1/GUADALUPE ST	W END	74	475	R
ELM ST - ELMST	010	FLOWER AVE	OBISPO ST	95	991	R
ESCALANTE ST - ESCALA	010	11TH ST (WEST)	11TH ST (EAST)	79	1242	R
ESCALANTE ST - ESCALA	020	ESCALANTE ST	END	80	183	R

City of Guadalupe
Desktop Reference Alphabetical

Street Name	Section ID	From	To	PCI	Length	Functional Class
ESPERANZA DR - ESPERA	010	FUENTE DR	LAS FLORES DR	95	625	R
FIFTH ST - FIFTH	010	HWY 1/GUADALUPE ST	CAMPODONICO AVE	78	364	R
FIFTH ST - FIFTH	020	CAMPODONICO AVE	TOGNAZZINI AVE	78	399	R
FIFTH ST - FIFTH	030	TOGNAZZINI AVE	PIONEER ST	78	295	R
FIFTH ST - FIFTH	040	PIONEER ST	DEGASPARIS ST	78	517	R
FIR ST - FIR	010	FLOWER AVE	OBISPO ST	95	991	R
FLOWER AVE - FLOWER	010	4TH ST	W MAIN ST	95	2342	R
FOURTH ST - FOURTH	010	FLOWER AVE	OBISPO ST	95	991	R
FOURTH ST - FOURTH	020	OBISPO ST	END	80	440	R
FUENTE DR - FUENTE	010	CASTILLO DR	LAS FLORES DR	95	1200	R
GARRETT ST - GARRET	010	PIONEER ST	DEGASPARIS ST	85	418	R
GULARTE LN - GULART	010	11TH ST	END	77	867	R
GUSTO CT - GUSTO	010	N END	LAS FLORES DR	95	230	R
HACIENDA DR - HACIENDA	010	ARROYO SECO RD	NINOS DR	95	1325	R
HERNANDEZ DR - HRNDEZ	010	PIONEER ST	CAMP LN	49	1013	R
HOLLY ST - HOLLY	010	FLOWER AVE	OBISPO ST	95	991	R
IBIS CI - IBISCI	010	END	PELICAN LN	85	225	R
JALAMA DR - JALAMA	010	ARROYO SECO RD	NINOS DR	95	1150	R
JULIA DR - JULIA	010	ALMAGUER ST	W MAIN ST	40	239	R
LA GUARDIA LN - LAGUARD	010	END	GULARTE LN	78	732	R
LA JOYA DR - LAJOYA	010	ARROYO SECO RD	NINOS DR	95	1225	R
LA PURISIMA ST - LAPURIS	010	SANTA BARBARA ST	CALLE CESAR E. CHAVEZ	95	448	R
LAS FLORES DR - LASFLOR	010	BUENA VISTA RD	FUENTE DR	95	1746	R
LINDY DR - LINDY	010	WONG ST	3RD ST	39	483	R
MAHONEY LN - MAHONY	010	CARLIN DR	PAGALING DR	35	480	R
MANZANITA ST - MANZAN	010	NINOS DR	FUENTE DR	95	275	R
MARYKNOLL DR - MRYKNL	010	PIONEER ST	LINDY DR	82	535	R
MASATANI CT - MSATNI	010	ALMAGUER ST	END	40	213	R
MILLS LN - MILSLN	010	END	HERNANDEZ DR	60	349	R
MONTEZ CT - MONTEZ	010	ALMAGUER ST	END	32	213	R
NELSON DR - NELSON	010	ALMAGUER ST	W MAIN ST	47	279	R
NINOS DR - NINOS	010	BUENA VISTA RD	MANZANITA ST	95	1025	R
NINTH ST - NINTH	010	E END	OBISPO ST	71	253	R
NINTH ST - NINTH	020	OBISPO ST	PACHECO ST	71	348	R
NINTH ST - NINTH	030	E END	HWY 1/GUADALUPE ST	83	626	R
NINTH ST - NINTH	040	HWY 1/GUADALUPE ST	PIONEER ST	80	420	R
OBISPO ST - OBISPO	010	12TH ST	11TH ST	74	480	C
OBISPO ST - OBISPO	020	11TH ST	10TH ST	67	474	C
OBISPO ST - OBISPO	030	10TH ST	9TH ST	56	457	C
OBISPO ST - OBISPO	040	9TH ST	4TH ST	48	1929	C
OBISPO ST - OBISPO	050	4TH ST	W MAIN ST	44	2378	C

City of Guadalupe
Desktop Reference Alphabetical

Street Name	Section ID	From	To	PCI	Length	Functional Class
OBISPO ST - OBISPO	060	W MAIN ST	BUENA VISTA RD	95	475	C
OBISPO ST - OBISPO	070	BUENA VISTA RD	MANZANITA ST	95	1085	R
OLIVERA ST - OLVERA	005	N END	12TH ST	0	185	R
OLIVERA ST - OLVERA	010	12TH ST	11TH ST	85	441	R
OLIVERA ST - OLVERA	020	11TH ST	10TH ST	85	462	R
OLIVERA ST - OLVERA	030	10TH ST	9TH ST	55	463	R
OLIVERA ST - OLVERA	040	9TH ST	HWY 1/GUADALUPE ST	83	1012	R
PACHECO ST - PCHECO	010	12TH ST	11TH ST	81	438	R
PACHECO ST - PCHECO	020	S END	10TH ST	71	793	R
PACHECO ST (NB) - PCHECON	010	10TH ST	11TH ST	71	442	R
PACHECO ST (SB) - PCHECOS	010	11TH ST	10TH ST	83	455	R
PACIFIC DUNES CI - PFCDNC	010	E END	PACIFIC DUNES WY	85	406	R
PACIFIC DUNES WY - PFCDNW	010	SNOWY PLOVER LN	SURFBIRD LN	84	750	R
PACIFIC DUNES WY - PFCDNW	020	SURFBIRD LN	W MAIN ST	84	792	R
PAGALING DR - PAGALI	010	PIONEER ST	MAHONEY LN	49	970	R
PELICAN LN - PELICA	010	SURFBIRD LN	SANDPIPER LN	100	800	R
PERALTA ST - PERALT	010	N END	COP 300' S/O N END	100	300	R
PERALTA ST - PERALT	020	COP 300' S/O N END	11TH ST	75	570	R
PERALTA ST - PERALT	030	11TH ST	10TH ST	85	442	R
PIONEER ST - PIONEE	010	5TH ST	WONG ST	36	425	C
PIONEER ST - PIONEE	015	WONG ST	3RD ST	90	590	C
PIONEER ST - PIONEE	020	3RD ST	2ND ST	90	968	C
PIONEER ST - PIONEE	030	2ND ST	W MAIN ST	90	686	C
PIONEER ST - PIONEE	040	8TH ST	9TH ST	77	993	R
POINT SAL DUNES CI - PTSLDNC	010	E END	POINT SAL DUNES WY	85	140	R
POINT SAL DUNES WY - PTSLDNW	010	SNOWY PLOVER LN	SURFBIRD LN	84	830	R
POINT SAL DUNES WY - PTSLDNW	020	SURFBIRD LN	W MAIN ST	83	583	R
RUBIO ST - RUBIO	010	N END	7TH ST	84	251	R
SAN MIGUEL CT - SNMIGL	010	END	CALLE CESAR E. CHAVEZ	95	332	R
SANCHEZ DR - SANCHZ	010	MILLS LN	CAMP LN	77	675	R
SANDPIPER LN - SNDPPR	010	E END	POINT SAL DUNES WY	85	295	R
SANDPIPER LN - SNDPPR	020	POINT SAL DUNES WY	PACIFIC DUNES WY	85	808	R
SANDPIPER LN - SNDPPR	030	PACIFIC DUNES WY	PELICAN LN	100	500	R
SANTA BARBARA ST - SANTAB	010	SANTA INES ST	W MAIN ST	43	814	R
SANTA INES ST - SANTAI	010	SANTA BARBARA ST	CALLE CESAR E. CHAVEZ	95	283	R
SECOND ST - SECOND	010	FLOWER AVE	OBISPO ST	95	991	R
SECOND ST - SECOND	020	HWY 1/GUADALUPE ST	CAMPODONICO AVE	83	365	C
SECOND ST - SECOND	030	CAMPODONICO AVE	TOGNAZZINI AVE	83	394	C
SECOND ST - SECOND	040	TOGNAZZINI AVE	PIONEER ST	44	292	C
SEVENTH ST - SEVNTH	010	RUBIO ST	W END	85	281	R
SIXTH ST - SIXTH	010	HWY 1/GUADALUPE ST	CAMPODONICO AVE	95	347	R

City of Guadalupe
Desktop Reference Alphabetical

Street Name	Section ID	From	To	PCI	Length	Functional Class
SNOWY PLOVER LN - SNWYPL	010	POINT SAL DUNES WY	PACIFIC DUNES WY	85	580	R
SNOWY PLOVER LN - SNWYPL	020	PACIFIC DUNES WY	END/GATE	85	868	R
SURFBIRD CT - SURFBC	010	SURBIRD LN	S END	85	211	R
SURFBIRD LN - SURFBL	010	SURFBIRD CT	POINT SAL DUNES WY	85	260	R
SURFBIRD LN - SURFBL	020	POINT SAL DUNES WY	PACIFIC DUNES WY	85	585	R
SURFBIRD LN - SURFBL	030	PACIFIC DUNES WY	PELICAN LN	85	540	R
SURFBIRD LN - SURFBL	040	PELICAN LN	SNOWY PLOVER LN	84	690	R
TENTH ST - TENTH	010	PERALTA ST	OBISPO ST	80	380	C
TENTH ST - TENTH	020	OBISPO ST	OLIVERA ST	67	737	C
TENTH ST - TENTH	030	OLIVERA ST	HWY 1/GUADALUPE ST	54	363	C
TENTH ST - TENTH	040	HWY 1/GUADALUPE ST	W END	53	370	C
THIRD ST - THIRD	010	FLOWER AVE	OBISPO ST	95	991	R
THIRD ST - THIRD	110	CAMPODONICO AVE	TOGNAZZINI AVE	83	377	R
THIRD ST - THIRD	120	TOGNAZZINI AVE	PIONEER ST	83	300	R
THIRD ST - THIRD	130	PIONEER ST	LINDY DR	95	636	R
TOGNAZZINI AVE - TOGNAZ	010	N END	5TH ST	95	326	R
TOGNAZZINI AVE - TOGNAZ	020	5TH ST	3RD ST	95	1040	C
TOGNAZZINI AVE - TOGNAZ	030	3RD ST	2ND ST	95	937	C
TOGNAZZINI AVE - TOGNAZ	040	2ND ST	W MAIN ST	95	670	C
TURNSTONE CI - TRNSTN	010	E END	SURFBIRD LN	85	374	R
TWELFTH ST - TWLFTH	010	PERALTA ST	OBISPO ST	72	361	R
TWELFTH ST - TWLFTH	020	PACHECO ST	HWY 1/GUADALUPE ST	46	759	R
W MAIN ST - WMAIN	010	HWY 1/GUADALUPE ST	TOGNAZZINI AVE	44	770	A
W MAIN ST - WMAIN	020	TOGNAZZINI AVE	PIONEER ST	46	210	A
W MAIN ST - WMAIN	030	PIONEER ST	POINT SAL DUNES WY	76	1634	A
W MAIN ST - WMAIN	040	POINT SAL DUNES WY	PACIFIC DUNES WY	69	800	A
W MAIN ST - WMAIN	050	PACIFIC DUNES WY	SANTA BARBARA ST	67	800	A
W MAIN ST - WMAIN	060	SANTA BARBARA ST	CITY LIMITS	57	900	A
WONG ST - WONGST	010	PIONEER ST	LINDY DR	45	409	R

Street List PCI High to Low

City of Guadalupe
Desktop Reference PCI High to Low

Street Name	Section ID	From	To	PCI	Length	Functional Class
PELICAN LN - PELICA	010	SURFBIRD LN	SANDPIPER LN	100	800	R
PERALTA ST - PERALT	010	N END	COP 300' S/O N END	100	300	R
SANDPIPER LN - SNDPPR	030	PACIFIC DUNES WY	PELICAN LN	100	500	R
AMBER ST - AMBER	010	FLOWER AVE	OBISPO ST	95	991	R
ARROYO SECO RD - ARROYOS	010	BUENA VISTA DR	JAMALA DR	95	550	R
BIRCH ST - BIRCH	010	FLOWER AVE	OBISPO ST	95	981	R
BUENA VISTA RD - BUENA	010	ARROYO SECO RD	LAS FLORES DR	95	2300	R
CALLE CESAR E. CHAVEZ ST - CACECH	010	RIVERVIEW ENTRANCE	W MAIN ST	95	1148	R
CARRASCO DR - CARRDR	010	HACIENDA DR	LA JOYA DR	95	103	R
CASTILLO DR - CASTILLO	010	FUENTE DR	LAS FLORES DR	95	630	R
CEDAR ST - CEDAR	010	FLOWER AVE	OBISPO ST	95	991	R
DEL MAR DR - DELMAR	010	OBISPO ST	LAS FLORES DR	95	835	R
ELM ST - ELMST	010	FLOWER AVE	OBISPO ST	95	991	R
ESPERANZA DR - ESPERA	010	FUENTE DR	LAS FLORES DR	95	625	R
FIR ST - FIR	010	FLOWER AVE	OBISPO ST	95	991	R
FLOWER AVE - FLOWER	010	4TH ST	W MAIN ST	95	2342	R
FOURTH ST - FOURTH	010	FLOWER AVE	OBISPO ST	95	991	R
FUENTE DR - FUENTE	010	CASTILLO DR	LAS FLORES DR	95	1200	R
GUSTO CT - GUSTO	010	N END	LAS FLORES DR	95	230	R
HACIENDA DR - HACIENDA	010	ARROYO SECO RD	NINOS DR	95	1325	R
HOLLY ST - HOLLY	010	FLOWER AVE	OBISPO ST	95	991	R
JALAMA DR - JALAMA	010	ARROYO SECO RD	NINOS DR	95	1150	R
LA JOYA DR - LAJOYA	010	ARROYO SECO RD	NINOS DR	95	1225	R
LA PURISIMA ST - LAPURIS	010	SANTA BARBARA ST	CALLE CESAR E. CHAVEZ	95	448	R
LAS FLORES DR - LASFLOR	010	BUENA VISTA RD	FUENTE DR	95	1746	R
MANZANITA ST - MANZAN	010	NINOS DR	FUENTE DR	95	275	R
NINOS DR - NINOS	010	BUENA VISTA RD	MANZANITA ST	95	1025	R
OBISPO ST - OBISPO	060	W MAIN ST	BUENA VISTA RD	95	475	C
OBISPO ST - OBISPO	070	BUENA VISTA RD	MANZANITA ST	95	1085	R
SAN MIGUEL CT - SNMIGL	010	END	CALLE CESAR E. CHAVEZ	95	332	R
SANTA INES ST - SANTAI	010	SANTA BARBARA ST	CALLE CESAR E. CHAVEZ	95	283	R
SECOND ST - SECOND	010	FLOWER AVE	OBISPO ST	95	991	R
SIXTH ST - SIXTH	010	HWY 1/GUADALUPE ST	CAMPODONICO AVE	95	347	R
THIRD ST - THIRD	010	FLOWER AVE	OBISPO ST	95	991	R
THIRD ST - THIRD	130	PIONEER ST	LINDY DR	95	636	R
TOGNAZZINI AVE - TOGNAZ	010	N END	5TH ST	95	326	R
TOGNAZZINI AVE - TOGNAZ	020	5TH ST	3RD ST	95	1040	C
TOGNAZZINI AVE - TOGNAZ	030	3RD ST	2ND ST	95	937	C
TOGNAZZINI AVE - TOGNAZ	040	2ND ST	W MAIN ST	95	670	C
PIONEER ST - PIONEE	015	WONG ST	3RD ST	90	590	C
PIONEER ST - PIONEE	020	3RD ST	2ND ST	90	968	C

City of Guadalupe
Desktop Reference PCI High to Low

Street Name	Section ID	From	To	PCI	Length	Functional Class
PIONEER ST - PIONEE	030	2ND ST	W MAIN ST	90	686	C
AVOCET CIR - AVOCIR	010	SURF BIRD LN	S. END	87	215	R
ALLEY S/O 5TH ST - ALLEY4	010	ALLEY W/O HWY 1	CAMPODONICO AVE	85	171	O
BLUE HERON CI - BLUHERC	010	END	BLUE HERON LN	85	112	R
BLUE HERON LN - BLUHERL	010	PACIFIC DUNES WAY	SURFBIRD LN	85	608	R
EGRET LN - EGRET	010	END	SURFBIRD LN	85	279	R
EGRET LN - EGRET	020	SURFBIRD LN	SANDPIPER LN	85	617	R
GARRETT ST - GARRET	010	PIONEER ST	DEGASPARIS ST	85	418	R
IBIS CI - IBISCI	010	END	PELICAN LN	85	225	R
OLIVERA ST - OLVERA	010	12TH ST	11TH ST	85	441	R
OLIVERA ST - OLVERA	020	11TH ST	10TH ST	85	462	R
PACIFIC DUNES CI - PFCDNC	010	E END	PACIFIC DUNES WY	85	406	R
PERALTA ST - PERALT	030	11TH ST	10TH ST	85	442	R
POINT SAL DUNES CI - PTSLDNC	010	E END	POINT SAL DUNES WY	85	140	R
SANDPIPER LN - SNDPPR	010	E END	POINT SAL DUNES WY	85	295	R
SANDPIPER LN - SNDPPR	020	POINT SAL DUNES WY	PACIFIC DUNES WY	85	808	R
SEVENTH ST - SEVNTH	010	RUBIO ST	W END	85	281	R
SNOWY PLOVER LN - SNWYPL	010	POINT SAL DUNES WY	PACIFIC DUNES WY	85	580	R
SNOWY PLOVER LN - SNWYPL	020	PACIFIC DUNES WY	END/GATE	85	868	R
SURFBIRD CT - SURFBC	010	SURBIRD LN	S END	85	211	R
SURFBIRD LN - SURFBL	010	SURFBIRD CT	POINT SAL DUNES WY	85	260	R
SURFBIRD LN - SURFBL	020	POINT SAL DUNES WY	PACIFIC DUNES WY	85	585	R
SURFBIRD LN - SURFBL	030	PACIFIC DUNES WY	PELICAN LN	85	540	R
TURNSTONE CI - TRNSTN	010	E END	SURFBIRD LN	85	374	R
PACIFIC DUNES WY - PFCDNW	010	SNOWY PLOVER LN	SURFBIRD LN	84	750	R
PACIFIC DUNES WY - PFCDNW	020	SURFBIRD LN	W MAIN ST	84	792	R
POINT SAL DUNES WY - PTSLDNW	010	SNOWY PLOVER LN	SURFBIRD LN	84	830	R
RUBIO ST - RUBIO	010	N END	7TH ST	84	251	R
SURFBIRD LN - SURFBL	040	PELICAN LN	SNOWY PLOVER LN	84	690	R
ALLEY W/O CAMPODONICO AVE - ALLEY5	020	5TH ST	3RD ST	83	975	O
ALLEY W/O CAMPODONICO AVE - ALLEY5	030	3RD ST	2ND ST	83	975	O
ALLEY W/O HWY 1 - ALLEY6	010	RUBIO ST	6TH ST	83	316	O
ALLEY W/O HWY 1 - ALLEY6	020	6TH ST	5TH ST	83	316	O
ALLEY W/O HWY 1 - ALLEY6	030	5TH ST	2ND ST	83	1968	O
CAMPONDONICO AVE - CAMPON	020	5TH ST	3RD ST	83	1050	R
CAMPONDONICO AVE - CAMPON	030	3RD ST	2ND ST	83	924	R
ELEVENTH ST - ELVNTH	010	CITY LIMIT/SIMAS	GULARTE LN	83	1855	A
NINTH ST - NINTH	030	E END	HWY 1/GUADALUPE ST	83	626	R
OLIVERA ST - OLVERA	040	9TH ST	HWY 1/GUADALUPE ST	83	1012	R
PACHECO ST (SB) - PCHECOS	010	11TH ST	10TH ST	83	455	R
POINT SAL DUNES WY - PTSLDNW	020	SURFBIRD LN	W MAIN ST	83	583	R

City of Guadalupe
Desktop Reference PCI High to Low

Street Name	Section ID	From	To	PCI	Length	Functional Class
SECOND ST - SECOND	020	HWY 1/GUADALUPE ST	CAMPODONICO AVE	83	365	C
SECOND ST - SECOND	030	CAMPODONICO AVE	TOGNAZZINI AVE	83	394	C
THIRD ST - THIRD	110	CAMPODONICO AVE	TOGNAZZINI AVE	83	377	R
THIRD ST - THIRD	120	TOGNAZZINI AVE	PIONEER ST	83	300	R
ALLEY W/O CAMPODONICO AVE - ALLEY5	010	N END	5TH ST	82	385	O
MARYKNOLL DR - MRYKNL	010	PIONEER ST	LINDY DR	82	535	R
PACHECO ST - PCHECO	010	12TH ST	11TH ST	81	438	R
EIGHTH ST - EIGHTH	010	HWY 1/GUADALUPE ST	PIONEER ST	80	320	R
ELEVENTH ST - ELVNTH	020	GULARTE LN	OBISPO ST	80	1573	A
ESCALANTE ST - ESCALA	020	ESCALANTE ST	END	80	183	R
FOURTH ST - FOURTH	020	OBISPO ST	END	80	440	R
NINTH ST - NINTH	040	HWY 1/GUADALUPE ST	PIONEER ST	80	420	R
TENTH ST - TENTH	010	PERALTA ST	OBISPO ST	80	380	C
ESCALANTE ST - ESCALA	010	11TH ST (WEST)	11TH ST (EAST)	79	1242	R
FIFTH ST - FIFTH	010	HWY 1/GUADALUPE ST	CAMPODONICO AVE	78	364	R
FIFTH ST - FIFTH	020	CAMPODONICO AVE	TOGNAZZINI AVE	78	399	R
FIFTH ST - FIFTH	030	TOGNAZZINI AVE	PIONEER ST	78	295	R
FIFTH ST - FIFTH	040	PIONEER ST	DEGASPARIS ST	78	517	R
LA GUARDIA LN - LAGUARD	010	END	GULARTE LN	78	732	R
GULARTE LN - GULART	010	11TH ST	END	77	867	R
PIONEER ST - PIONEE	040	8TH ST	9TH ST	77	993	R
SANCHEZ DR - SANCHZ	010	MILLS LN	CAMP LN	77	675	R
W MAIN ST - WMAIN	030	PIONEER ST	POINT SAL DUNES WY	76	1634	A
PERALTA ST - PERALT	020	COP 300' S/O N END	11TH ST	75	570	R
ALLEY W/O OBISPO ST - ALLEY7	010	ALLEY N/O 4TH ST #2	FENCE S/O ALLEY N/O 4TH ST	74	230	O
ELEVENTH ST - ELVNTH	040	HWY 1/GUADALUPE ST	W END	74	475	R
OBISPO ST - OBISPO	010	12TH ST	11TH ST	74	480	C
ALLEY N/O 4TH ST - ALLEY1	010	OBISPO ST	END	72	371	O
ELEVENTH ST - ELVNTH	030	OBISPO ST	HWY /GUADALUPE ST	72	1115	A
TWELFTH ST - TWLFTH	010	PERALTA ST	OBISPO ST	72	361	R
NINTH ST - NINTH	010	E END	OBISPO ST	71	253	R
NINTH ST - NINTH	020	OBISPO ST	PACHECO ST	71	348	R
PACHECO ST - PCHECO	020	S END	10TH ST	71	793	R
PACHECO ST (NB) - PCHECON	010	10TH ST	11TH ST	71	442	R
W MAIN ST - WMAIN	040	POINT SAL DUNES WY	PACIFIC DUNES WY	69	800	A
OBISPO ST - OBISPO	020	11TH ST	10TH ST	67	474	C
TENTH ST - TENTH	020	OBISPO ST	OLIVERA ST	67	737	C
W MAIN ST - WMAIN	050	PACIFIC DUNES WY	SANTA BARBARA ST	67	800	A
CAMP LN - CAMPLN	010	END	HERNADEZ DR	63	508	R
CAMPONDONICO AVE - CAMPON	010	7TH ST	5TH ST	63	651	R
ALLEY N/O 4TH ST #2 - ALLEY2	010	OBISPO ST	END	60	372	O

City of Guadalupe
Desktop Reference PCI High to Low

Street Name	Section ID	From	To	PCI	Length	Functional Class
MILLS LN - MILSLN	010	END	HERNANDEZ DR	60	349	R
DEGASPARIS ST - DEGASP	010	5TH ST	GARRET ST	57	208	R
W MAIN ST - WMAIN	060	SANTA BARBARA ST	CITY LIMITS	57	900	A
OBISPO ST - OBISPO	030	10TH ST	9TH ST	56	457	C
ALLEY N/O 7TH ST - ALLEY3	010	HWY 1/GUADALUPE ST	RUBIO ST	55	150	O
OLIVERA ST - OLVERA	030	10TH ST	9TH ST	55	463	R
CARLIN DR - CARLIN	010	PAGALING DR	MAHONEY LN	54	890	R
TENTH ST - TENTH	030	OLIVERA ST	HWY 1/GUADALUPE ST	54	363	C
TENTH ST - TENTH	040	HWY 1/GUADALUPE ST	W END	53	370	C
HERNANDEZ DR - HRNDEZ	010	PIONEER ST	CAMP LN	49	1013	R
PAGALING DR - PAGALI	010	PIONEER ST	MAHONEY LN	49	970	R
OBISPO ST - OBISPO	040	9TH ST	4TH ST	48	1929	C
NELSON DR - NELSON	010	ALMAGUER ST	W MAIN ST	47	279	R
TWELFTH ST - TWLFTH	020	PACHECO ST	HWY 1/GUADALUPE ST	46	759	R
W MAIN ST - WMAIN	020	TOGNAZZINI AVE	PIONEER ST	46	210	A
WONG ST - WONGST	010	PIONEER ST	LINDY DR	45	409	R
OBISPO ST - OBISPO	050	4TH ST	W MAIN ST	44	2378	C
SECOND ST - SECOND	040	TOGNAZZINI AVE	PIONEER ST	44	292	C
W MAIN ST - WMAIN	010	HWY 1/GUADALUPE ST	TOGNAZZINI AVE	44	770	A
CHAPMAN DR - CHAPMA	010	PIONEER ST	PAGALING DR	43	904	R
SANTA BARBARA ST - SANTAB	010	SANTA INES ST	W MAIN ST	43	814	R
JULIA DR - JULIA	010	ALMAGUER ST	W MAIN ST	40	239	R
MASATANI CT - MSATNI	010	ALMAGUER ST	END	40	213	R
LINDY DR - LINDY	010	WONG ST	3RD ST	39	483	R
ALMAGUER ST - ALMAG	010	PIONEER ST	NELSON DR	37	1089	R
PIONEER ST - PIONEE	010	5TH ST	WONG ST	36	425	C
MAHONEY LN - MAHONY	010	CARLIN DR	PAGALING DR	35	480	R
MONTEZ CT - MONTEZ	010	ALMAGUER ST	END	32	213	R
OLIVERA ST - OLVERA	005	N END	12TH ST	0	185	R

Section V
GIS Toolbox

GIS TOOLBOX

This section is intended to introduce the new feature in StreetSaver®. The GIS portion of the program is specifically designed for those agencies that do not have "in-house" GIS departments.

GIS TOOLBOX

The GIS toolbox is a new feature available within StreetSaver®. This is one of the most powerful tools available in StreetSaver®. The ability to link the existing road segments to a base map and produce maps displaying the Current Condition, Age of Pavement, Needs Treatments, Scenario Treatments, Last Treatment and Last Year Inspected are now available with just a few key strokes. No longer does an agency need to access "outside resources" or "wait" for graphical representations of their road system.

Maps that reflect the current condition of an agency's road system are a valuable asset when meeting with Town Councils and the general public. A map of future maintenance treatments can be used to inform the residents when future work is scheduled on their road.

A basic "shapefile" is already loaded into the StreetSaver® system. From this shapefile it is just a matter of "linking" or "assigning" the beginning location and ending location of each management section found in the database.

There are a few cautions that the City of Guadalupe should be aware of in regard to the GIS mapping. GIS is a "node" to "node" application. It uses intersections or nodes as its way to pinpoint a specific location. This means that each of the Town's management sections needs to begin and end at a point that can be defined or found by the GIS link. Using house numbers or change in pavements will need to be defined as "feet" from the nearest "node". This will produce a more precise map. Next the Street Names will need to match and that will mean a more precise accounting of "street tags". The difference between calling a tag a "drive" or an "avenue" can hinder the linking process.

TERMINOLOGY

Once the GIS Toolbox is opened there will be two master items that can be accessed.

First there is the "GIS Reporting". This screen is used to "mine" StreetSaver® data for display in GIS format. Queries can be performed using the standard StreetSaver® filter screen, using pre-defined criteria defined by the system, or by selecting an area of the map. If Section data is returned those shapes can be exported to GIS shapefiles or printed out in a map format.

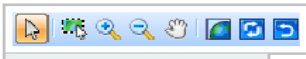
Then there is the “Section Link” screen which will match segments in the basemap based on street name, type (street tag) and/or direction. Each Section can be linked to a segment or segments in the basemap.

Explanations of the toolbars and the buttons available on the GIS Reporting screen are outlined below:

Navigation Toolbar

Select Sections from Map (Area Filter)	Click and Drag the mouse over an area on the map to search and retrieve sections within that area. **Note:** This works in conjunction with an applied Filter
Clear Area Filter	Clears the current selected area filter
Filter	Loads the Filter screen and retrieves sections based on the filter defined **Note:** This works in conjunction with an applied Area Filter
Clear Filter	Restores the shape to it’s state before any Add or Edits had occurred
Export Shapefiles	For each shape type currently showing on the map, a shapefile is created and stuffed in a ZIP file for download. This file will contain 3 files for every shape type. Those 3 files make up the Shapefile that can be used in other GIS applications
Print Map	Launches a Print Preview screen of the current Map and will resize based on the type of printer you choose

Reporting Toolbar



Select	Shows a tooltip of information regarding the section the mouse if pointing to an object.
Track Zoom In	Click and drag the mouse over an area of the map you want to Zoom in on.
Zoom In	Each click will Zoom the map in by 20%.
Zoom Out	Each click will Zoom the map OUT by 20%.
Pan	Click and drag the map around to navigate a specified direction.
Full Extent	Zooms out to the full border of your state.
Toggle Extent	Will toggle between the current Map extent and previous Map extent.
Previous Extent	Will cycle through each previous Map extent.

BASE MAP IMPLEMENTATION

Pavement Engineering Inc. reviewed the base map included with StreetSaver® and the automatic linking process. The review found most of the segments were linked correctly. Any of the segments that were not previously linked were fixed so they were linked.

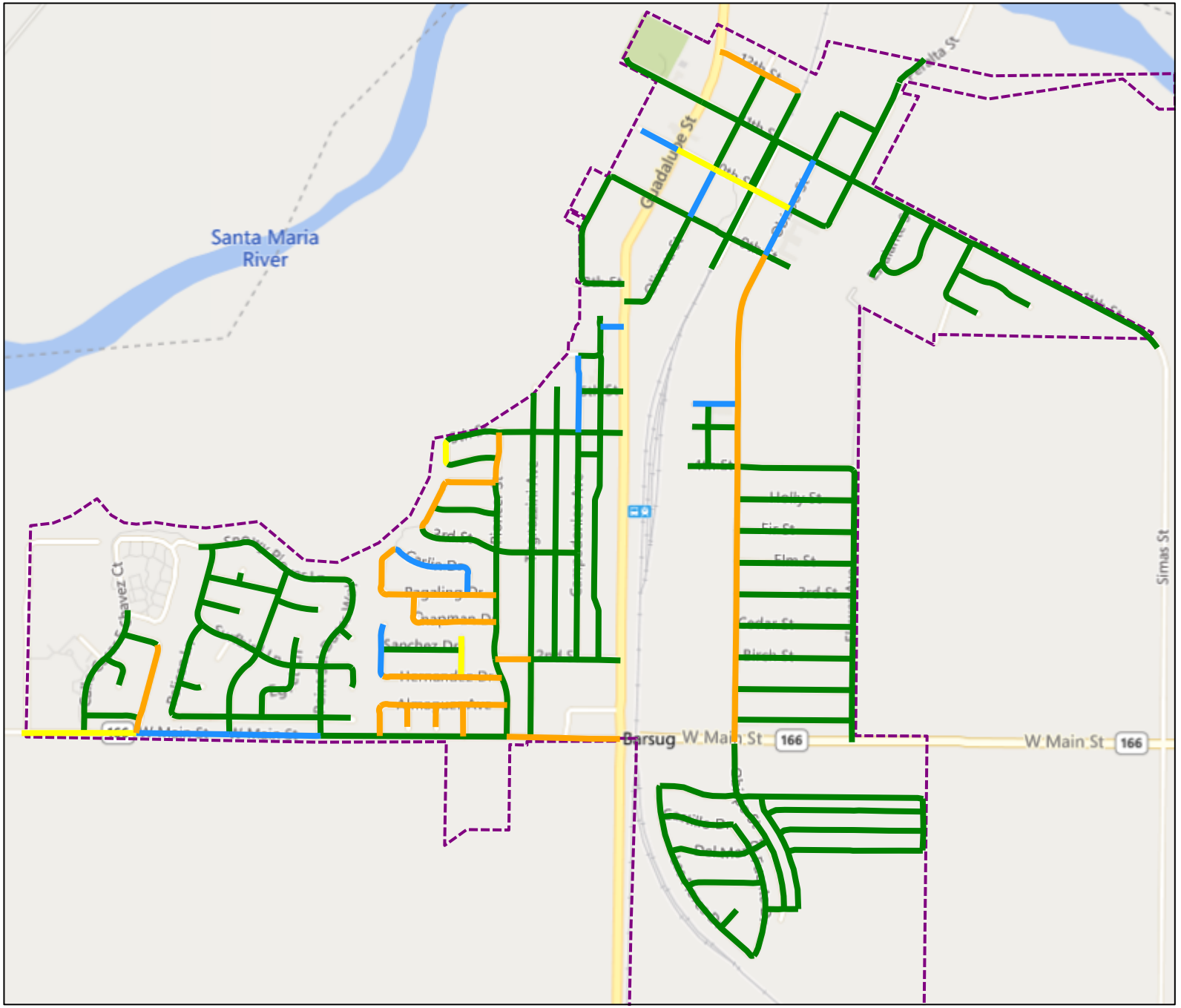
City of Guadalupe

Current PCI Condition

Printed: 10/15/2019

Feature Legend

- Category I - Very Good
- Category II - Good (Non-Load)
- Category III - Good (Load)
- Category IV - Poor



0 0.5 Miles

Appendix A
Summarized System Information

Network Summary Statistics

Printed: 10/15/2019

	Total Sections	Total Center Miles	Total Lane Miles	Total Area (sq. ft.)	PCI
Arterial	9	1.83	3.66	357,448	71
Collector	20	2.73	5.46	589,434	68
Residential/Local	111	13.46	26.92	2,631,478	82
Other	11	1.18	2.36	115,270	79
Total	151	19.20	38.40	3,693,630	
				Overall Network PCI as of 10/15/2019:	79
**Combined	1	0.04	0.07	7,955	N/A
Gravel	1	0.04	0.07	7,955	N/A

** Combined Sections are excluded from totals. These Sections do not have a PCI Date - they have not been inspected or had a Treatment applied.

Network Replacement Cost

Printed: 10/15/2019

Functional Class	Surface Type	Lane Miles	Unit Cost/ Square Foot	Pavement Area/ Square Feet	Cost To Replace (in thousands)
Arterial	AC	3.7	$25.00	357,448	$8,938
Collector	AC	4.6	$18.55	504,848	$9,367
	AC/AC	0.9	$18.55	84,586	$1,569
Other	AC	2.4	$15.35	115,270	$1,769
Residential/Local	AC	26.0	$15.35	2,542,774	$39,029
	AC/AC	0.9	$15.35	88,704	$1,361
	Grand Total:	38.4		3,693,630	$62,033

Decision Tree

Printed: 10/15/2019

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Arterial	AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	3		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		5	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$225.04			
	AC/AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	3		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		6	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			2
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$225.04			
	AC/PCC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	3		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		6	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			2
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT SURFACE (AC)	$225.04			
	PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	3		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		DO NOTHING	$0.00			
		III - Good, Load Related		DO NOTHING	$0.00			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$225.04			

Functional Class and Surface combination not used

Selected Treatment is not a Surface Seal

Decision Tree

Printed: 10/15/2019

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Arterial	ST	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$225.04			

Functional Class and Surface combination not used

Selected Treatment is not a Surface Seal

Decision Tree

Printed: 10/15/2019

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Collector	AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	3		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		5	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$166.98			
	AC/AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	4		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		7	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$166.98			
	AC/PCC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	4		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		7	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$166.98			
	PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		DO NOTHING	$0.00			
		III - Good, Load Related		DO NOTHING	$0.00			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$166.98			

Functional Class and Surface combination not used

Selected Treatment is not a Surface Seal

Decision Tree

Printed: 10/15/2019

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Collector	ST	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$166.98			

Functional Class and Surface combination not used

Selected Treatment is not a Surface Seal

Decision Tree

Printed: 10/15/2019

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Residential/Local	AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	3		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		5	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$138.14			
	AC/AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	4		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		8	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$138.14			
	AC/PCC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	4		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		8	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$138.14			
	PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	4		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		DO NOTHING	$0.00			
		III - Good, Load Related		DO NOTHING	$0.00			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$138.14			

Functional Class and Surface combination not used

Selected Treatment is not a Surface Seal

Decision Tree

Printed: 10/15/2019

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Residential/Local	ST	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$138.14			

Functional Class and Surface combination not used

Selected Treatment is not a Surface Seal

Decision Tree

Printed: 10/15/2019

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Other	AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	4		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		8	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$138.14			
	AC/AC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	4		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		8	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$138.14			
	AC/PCC	I - Very Good	Crack Treatment	SEAL CRACKS	$1.61	4		
			Surface Treatment	LIGHT MAINTENANCE	$5.03		8	
			Restoration Treatment	LIGHT REHABILITATION	$34.56			3
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT	$138.14			
	PCC	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		DO NOTHING	$0.00			
		III - Good, Load Related		DO NOTHING	$0.00			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$138.14			

Functional Class and Surface combination not used

Selected Treatment is not a Surface Seal

Decision Tree

Printed: 10/15/2019

Functional Class	Surface	Condition Category	Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Other	ST	I - Very Good	Crack Treatment	DO NOTHING	$0.00	9		
			Surface Treatment	DO NOTHING	$0.00		99	
			Restoration Treatment	DO NOTHING	$0.00			100
		II - Good, Non-Load Related		HEAVY MAINTENANCE	$27.66			
		III - Good, Load Related		LIGHT REHABILITATION	$34.56			
		IV - Poor		HEAVY REHABILITATION	$69.13			
		V - Very Poor		RECONSTRUCT STRUCTURE (AC)	$138.14			

Functional Class and Surface combination not used

Selected Treatment is not a Surface Seal

Appendix B
Budget Scenarios

Needs Analysis
&
Zero Budget
($7.6 Million over 5 Years)

- Projected PCI/Cost Summary

Needs - Projected PCI/Cost Summary

Inflation Rate = 0.00 %

Printed: 10/14/2019

Year	PCI Treated	PCI Untreated	PM Cost	Rehab Cost	Cost
2020	90	78	$344,185	$5,177,262	$5,521,447
2021	87	76	$1,881	$692,503	$694,384
2022	87	74	$438,021	$241,160	$679,181
2023	87	72	$257,054	$229,456	$486,510
2024	86	70	$64,556	$164,830	$229,386

% PM	PM Total Cost	Rehab Total Cost	Total Cost
14.53%	$1,105,697	$6,505,211	$7,610,908

Maintain PCI

($775 Thousand over 5 Years)

- Pavement Network Condition Lane Miles
- Network Condition Summary
- Cost Summary

Target-Driven Scenarios
Pavement Network Condition Lane Miles

Interest: .00% Inflation: .00% Printed: 10/14/2019

Scenario: Maintain 79 PCI

Objective: Minimum Network Average PCI Target: Overall 79

Annual budget needs to meet target objectives

Year	Arterial	Collector	Res/Loc	Other	Preventative Maintenance	Total
2020	$101,343	$14,423	$62,757	$0	$178,523	$178,523
2021	$51,618	$784,949	$152,887	$3,343	$167,543	$992,797
2022	$0	$244,890	$437,558	$463	$438,021	$682,911
2023	$256,702	$239,062	$488,170	$0	$255,472	$983,934
2024	$150,789	$62,784	$801,098	$23,044	$64,025	$1,037,715

Average Yearly Total: $775,176

Grand Total: $3,875,880

Pavement Network prior to treatments in lane miles.

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	71	6.2%	0.8%	17
Collector	67	7.2%	5.8%	14
Other	78	2.8%	0.0%	25
Residential	82	60.4%	7.8%	31

Pavement Network after schedulable treatments applied in lane miles.

2020

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	75	6.2%	0.8%	17
Collector	67	7.2%	5.8%	14
Other	78	2.8%	0.0%	25
Residential	82	60.4%	7.8%	31

2021

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	73	5.1%	0.7%	17
Collector	75	10.4%	4.3%	18
Other	77	2.5%	0.0%	25
Residential	81	58.7%	7.8%	30

Pavement Network after schedulable treatments applied in lane miles.

2022

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	71	5.1%	0.7%	16
Collector	74	10.7%	4.1%	18
Other	77	2.5%	0.0%	24
Residential	82	58.7%	8.6%	30

2023

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	74	6.0%	0.7%	17
Collector	74	11.4%	3.5%	19
Other	75	2.5%	0.1%	23
Residential	82	59.7%	8.4%	30

2024

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	72	7.3%	0.7%	17
Collector	72	11.4%	3.5%	19
Other	75	2.6%	0.0%	23
Residential	82	61.9%	6.2%	30

Scenario: Maintain 79 PCI

Objective: Minimum Network Average PCI Target: Overall 79

Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment
2020	78	79
2021	76	79
2022	74	79
2023	72	79
2024	70	79

Percent Network Area by Functional Classification and Condition Class

Condition in base year 2020, prior to applying treatments.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	6.2%	7.2%	60.4%	2.8%	76.7%
II / III	2.6%	2.9%	3.0%	0.3%	8.9%
IV	0.8%	5.8%	7.8%	0.0%	14.4%
Total	9.7%	16.0%	71.2%	3.1%	100.0%

Condition in year 2020 after schedulable treatments applied.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	6.2%	7.2%	60.4%	2.8%	76.7%
II / III	2.6%	2.9%	3.0%	0.3%	8.9%
IV	0.8%	5.8%	7.8%	0.0%	14.4%
Total	9.7%	16.0%	71.2%	3.1%	100.0%

Condition in year 2024 after schedulable treatments applied.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	7.3%	11.4%	61.9%	2.6%	83.2%
II / III	1.7%	1.1%	3.1%	0.5%	6.5%
IV	0.7%	0.0%	5.1%	0.0%	5.8%
V	0.0%	3.5%	1.1%	0.0%	4.6%
Total	9.7%	16.0%	71.2%	3.1%	100.0%

Target-Driven Scenarios - Cost Summary

Interest: 0% Inflation: 0% Printed: 10/14/2019

Scenario: Maintain 79 PCI

Objective: Minimum Network Average PCI Target: Overall 79

Year	Rehabilitation		Preventive Maintenance		Total Cost	Deferred
2020	II	$0	Non-Project	$178,523	$178,523	$5,342,895
	III	$0	Project	$0		
	IV	$0				
	V	**$0**				
	Total	**$0**				
	Project	$0				
2021	II	$0	Non-Project	$167,543	$992,797	$4,861,001
	III	$121,694	Project	$0		
	IV	$703,560				
	V	**$0**				
	Total	**$825,254**				
	Project	$0				
2022	II	$0	Non-Project	$438,021	$682,911	$5,109,749
	III	$0	Project	$0		
	IV	$244,890				
	V	**$0**				
	Total	**$244,890**				
	Project	$0				
2023	II	$0	Non-Project	$255,472	$983,934	$4,697,082
	III	$0	Project	$0		
	IV	$728,462				
	V	**$0**				
	Total	**$728,462**				
	Project	$0				
2024	II	$150,778	Non-Project	$64,025	$1,037,715	$5,377,158
	III	$0	Project	$0		
	IV	$471,069				
	V	**$351,843**				
	Total	**$973,690**				
	Project	$0				

Summary

Functional Class	Rehabilitation	Prev. Maint.
Arterial	$458,177	$102,275
Collector	$1,208,081	$138,027
Other	$23,044	$3,806
Residential/Local	$1,082,994	$859,476
Total:	$2,772,296	$1,103,584

Grand Total: $3,875,880

Current Funding

($350 Thousand over 5 Years)

- Network Condition Summary
- Cost Summary
- Sections Selected for Treatment
- GIS Maps of Treatments by year

Scenarios - Network Condition Summary

Interest: 0% Inflation: 0% Printed: 10/14/2019

Scenario: 5yr Budget

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2020	$370,000	5%	2022	$332,000	5%	2024	$338,000	5%
2021	$371,000	5%	2023	$338,000	5%			

Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment	Treated Centerline Miles	Treated Lane Miles
2020	78	79	1.61	3.22
2021	76	78	2.97	5.94
2022	74	76	1.33	2.65
2023	72	75	1.00	2.00
2024	70	74	0.83	1.67

Percent Network Area by Functional Class and Condition Category

Condition in base year 2020, prior to applying treatments.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	6.2%	7.2%	60.4%	2.8%	76.7%
II / III	2.6%	2.9%	3.0%	0.3%	8.9%
IV	0.8%	5.8%	7.8%	0.0%	14.4%
Total	9.7%	16.0%	71.2%	3.1%	100.0%

Condition in year 2020 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	6.9%	8.1%	60.4%	2.8%	78.2%
II / III	2.6%	2.1%	3.0%	0.3%	8.0%
IV	0.2%	5.8%	7.8%	0.0%	13.8%
Total	9.7%	16.0%	71.2%	3.1%	100.0%

Condition in year 2024 after schedulable treatments applied.

Condition	Arterial	Collector	Res/Loc	Other	Total
I	5.0%	8.5%	57.8%	2.9%	74.2%
II / III	4.7%	1.7%	5.4%	0.3%	11.9%
IV	0.0%	2.3%	6.4%	0.0%	8.7%
V	0.0%	3.5%	1.7%	0.0%	5.2%
Total	9.7%	16.0%	71.2%	3.1%	100.0%

Scenarios - Cost Summary

Interest: .00% Inflation: .00% Printed: 10/14/2019

Scenario: 5yr Budget

Year	PM	Budget		Rehabilitation		Preventative Maintenance	Surplus PM	Deferred		Stop Gap
2020	5%	$370,000	II	$0	Non-Project	$18,202	$298	$5,192,258	Funded	$0
			III	$121,694					Unmet	$15,572
			IV	$189,263	Project	$0				
			V	$0						
			Total	$310,957						
			Project	$0						
2021	5%	$371,000	II	$49,804	Non-Project	$16,418	$2,132	$5,340,419	Funded	$0
			III	$0					Unmet	$1,525
			IV	$296,508	Project	$0				
			V	$0						
			Total	$346,312						
			Project	$0						
2022	5%	$332,000	II	$44,379	Non-Project	$16,291	$309	$5,942,551	Funded	$0
			III	$0					Unmet	$305
			IV	$268,848	Project	$0				
			V	$0						
			Total	$313,227						
			Project	$0						
2023	5%	$338,000	II	$18,379	Non-Project	$16,142	$758	$6,474,521	Funded	$0
			III	$0					Unmet	$1,496
			IV	$278,825	Project	$0				
			V	$0						
			Total	$297,204						
			Project	$0						
2024	5%	$338,000	II	$0	Non-Project	$16,629	$271	$8,083,798	Funded	$0
			III	$0					Unmet	$1,153
			IV	$291,545	Project	$0				
			V	$0						
			Total	$291,545						
			Project	$0						

Summary

Functional Class	Rehabilitation	Prev. Maint.	Funded Stop Gap	Unmet Stop Gap
Arterial	$496,662	$48	$0	$3,114
Collector	$556,139	$27,198	$0	$6,445
Other	$72,209	$463	$0	$178
Residential/Local	$434,235	$55,973	$0	$10,315
Grand Total:	$1,559,245	$83,682	$0	$20,051

Scenarios - Sections Selected for Treatment

Interest: .00% Inflation: .00% Printed: 10/14/2019

Scenario: 5yr Budget

Year	Budget	PM	Year	Budget	PM	Year	Budget	PM
2020	$370,000	5%	2022	$332,000	5%	2024	$338,000	5%
2021	$371,000	5%	2023	$338,000	5%			

Year: 2020

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment PCI Before	Treatment PCI After	Cost	Rating	Treatment
W MAIN ST	HWY 1/GUADALUPE ST	TOGNAZZINI AVE	75	010	770	32	24,640	A	AC		43	42	100	$189,263	16,039	HEAVY REHABILITATION
												Treatment Total		$189,263		
TENTH ST	OBISPO ST	OLIVERA ST	70	020	737	43	31,691	C	AC		66	66	100	$121,694	19,310	LIGHT REHABILITATION
												Treatment Total		$121,694		
PACHECO ST	12TH ST	11TH ST	47	010	438	12	5,256	R	AC		80	80	88	$2,938	30,113	LIGHT MAINTENANCE
SECOND ST	HWY 1/GUADALUPE ST	CAMPODONICO AVE	64	020	365	34	12,410	C	AC		82	82	89	$6,936	32,081	LIGHT MAINTENANCE
SECOND ST	CAMPODONICO AVE	TOGNAZZINI AVE	64	030	394	34	13,396	C	AC		82	82	89	$7,487	32,081	LIGHT MAINTENANCE
												Treatment Total		$17,361		
BLUE HERON LN	PACIFIC DUNES WAY	SURFBIRD LN	12	010	608	37	22,496	R	AC		84	84	85	$85	767,149	SEAL CRACKS
PACIFIC DUNES CI	E END	PACIFIC DUNES WY	50	010	406	37	15,022	R	AC		84	84	85	$57	767,149	SEAL CRACKS
PACIFIC DUNES WY	SNOWY PLOVER LN	SURFBIRD LN	51	010	750	37	27,750	R	AC		83	83	84	$112	768,822	SEAL CRACKS
POINT SAL DUNES CI	E END	POINT SAL DUNES WY	56	010	140	38	5,320	R	AC		84	84	85	$20	767,149	SEAL CRACKS
POINT SAL DUNES WY	SNOWY PLOVER LN	SURFBIRD LN	57	010	830	38	31,540	R	AC		83	83	84	$128	768,822	SEAL CRACKS
SNOWY PLOVER LN	POINT SAL DUNES WY	PACIFIC DUNES WY	67	010	580	38	22,040	R	AC		84	84	85	$83	767,149	SEAL CRACKS
SNOWY PLOVER LN	PACIFIC DUNES WY	END/GATE	67	020	868	38	32,984	R	AC		84	84	85	$124	767,149	SEAL CRACKS
SURFBIRD LN	PACIFIC DUNES WY	PELICAN LN	69	030	540	37	19,980	R	AC		84	84	85	$75	767,149	SEAL CRACKS
SURFBIRD LN	PELICAN LN	SNOWY PLOVER LN	69	040	690	37	25,530	R	AC		83	83	84	$103	768,822	SEAL CRACKS
TURNSTONE CI	E END	SURFBIRD LN	73	010	374	38	14,212	R	AC		84	84	85	$54	767,149	SEAL CRACKS
												Treatment Total		$841		
									Year 2020 Area Total	304,267		Year 2020 Total		$329,159		

Scenarios - Sections Selected for Treatment

Interest: .00% Inflation: .00% Printed: 10/14/2019

Scenario: 5yr Budget

Year: 2021

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment PCI Before	Treatment PCI After	Cost	Rating	Treatment
TENTH ST	OLIVERA ST	HWY 1/GUADALUPE ST	70	030	363	44	15,972	C	AC		53	49	100	$122,683	11,385	HEAVY REHABILITATION
TENTH ST	HWY 1/GUADALUPE ST	W END	70	040	370	43	15,910	C	AC		52	47	100	$122,207	11,454	HEAVY REHABILITATION
W MAIN ST	TOGNAZZINI AVE	PIONEER ST	75	020	210	32	6,720	A	AC		45	41	100	$51,618	16,129	HEAVY REHABILITATION
												Treatment Total		$296,508		
ALLEY N/O 4TH ST	OBISPO ST	END	01	010	371	27	10,017	O	AC		71	69	78	$30,786	5,527	HEAVY MAINTENANCE
PACHECO ST (NB)	10TH ST	11TH ST	48	010	442	14	6,188	R	AC		70	68	78	$19,018	5,454	HEAVY MAINTENANCE
												Treatment Total		$49,804		
GULARTE LN	11TH ST	END	30	010	867	30	26,010	R	AC		76	74	83	$14,537	31,648	LIGHT MAINTENANCE
												Treatment Total		$14,537		
CAMPONDONICO AVE	5TH ST	3RD ST	15	020	1,050	33	34,650	R	AC		82	80	82	$167	764,205	SEAL CRACKS
CAMPONDONICO AVE	3RD ST	2ND ST	15	030	924	34	31,416	R	AC		82	80	82	$152	764,205	SEAL CRACKS
EGRET LN	END	SURFBIRD LN	20	010	279	37	10,323	R	AC		84	82	84	$44	773,485	SEAL CRACKS
EGRET LN	SURFBIRD LN	SANDPIPER LN	20	020	617	37	22,829	R	AC		84	82	84	$97	773,485	SEAL CRACKS
ESCALANTE ST	11TH ST (WEST)	11TH ST (EAST)	24	010	1,242	30	37,260	R	AC		78	76	79	$224	717,057	SEAL CRACKS
ESCALANTE ST	ESCALANTE ST	END	24	020	183	26	4,758	R	AC		79	77	79	$28	729,944	SEAL CRACKS
FOURTH ST	OBISPO ST	END	28	020	440	42	18,480	R	AC/AC		79	78	80	$105	1,103,141	SEAL CRACKS
GARRETT ST	PIONEER ST	DEGASPARIS ST	29	010	418	38	15,884	R	AC		84	82	84	$67	773,485	SEAL CRACKS
IBIS CI	END	PELICAN LN	33	010	225	37	8,325	R	AC		84	82	84	$36	773,485	SEAL CRACKS
MARYKNOLL DR	PIONEER ST	LINDY DR	39	010	535	33	17,655	R	AC		81	79	81	$91	757,674	SEAL CRACKS
PACIFIC DUNES WY	SURFBIRD LN	W MAIN ST	51	020	792	37	29,304	R	AC		83	81	83	$133	770,193	SEAL CRACKS
PERALTA ST	11TH ST	10TH ST	54	030	442	44	19,448	R	AC		84	82	84	$82	773,501	SEAL CRACKS
PIONEER ST	WONG ST	3RD ST	55	015	590	38	22,420	C	AC/AC		89	87	88	$15	8,631,137	SEAL CRACKS
PIONEER ST	3RD ST	2ND ST	55	020	968	38	36,784	C	AC/AC		89	87	88	$24	8,631,137	SEAL CRACKS
PIONEER ST	2ND ST	W MAIN ST	55	030	686	37	25,382	C	AC/AC		89	87	88	$17	8,631,137	SEAL CRACKS
POINT SAL DUNES WY	SURFBIRD LN	W MAIN ST	57	020	583	38	22,154	R	AC		82	80	82	$107	764,205	SEAL CRACKS
RUBIO ST	N END	7TH ST	58	010	251	31	7,781	R	AC		83	81	83	$36	770,193	SEAL CRACKS
SANDPIPER LN	E END	POINT SAL DUNES WY	61	010	295	38	11,210	R	AC		84	82	84	$48	773,485	SEAL CRACKS
SANDPIPER LN	POINT SAL DUNES WY	PACIFIC DUNES WY	61	020	808	38	30,704	R	AC		84	82	84	$130	773,485	SEAL CRACKS
SURFBIRD CT	SURBIRD LN	S END	68	010	211	37	7,807	R	AC		84	82	84	$33	773,485	SEAL CRACKS
SURFBIRD LN	SURFBIRD CT	POINT SAL DUNES WY	69	010	260	37	9,620	R	AC		84	82	84	$41	773,485	SEAL CRACKS
SURFBIRD LN	POINT SAL DUNES WY	PACIFIC DUNES WY	69	020	585	37	21,645	R	AC		84	82	84	$92	773,485	SEAL CRACKS

Scenarios - Sections Selected for Treatment

Interest: .00% Inflation: .00% Printed: 10/14/2019

Scenario: 5yr Budget

Year: 2021

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment PCI Before	Treatment PCI After	Cost	Rating	Treatment
THIRD ST	CAMPODONICO AVE	TOGNAZZINI AVE	71	110	377	34	12,818	R	AC		82	80	82	$62	764,205	SEAL CRACKS
THIRD ST	TOGNAZZINI AVE	PIONEER ST	71	120	300	34	10,200	R	AC		82	80	82	$50	764,205	SEAL CRACKS
													Treatment Total	$1,881		
							Year 2021 Area Total	549,674					Year 2021 Total	$362,730		

Year: 2022

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment PCI Before	Treatment PCI After	Cost	Rating	Treatment
NELSON DR	ALMAGUER ST	W MAIN ST	43	010	279	37	10,323	R	AC		46	41	100	$79,293	11,224	HEAVY REHABILITATION
OBISPO ST	10TH ST	9TH ST	45	030	457	54	24,678	C	AC		55	47	100	$189,555	11,490	HEAVY REHABILITATION
													Treatment Total	$268,848		
TWELFTH ST	PERALTA ST	OBISPO ST	74	010	361	40	14,440	R	AC		71	68	77	$44,379	5,410	HEAVY MAINTENANCE
													Treatment Total	$44,379		
BLUE HERON CI	END	BLUE HERON LN	11	010	112	37	4,144	R	AC		84	81	88	$2,317	29,532	LIGHT MAINTENANCE
EIGHTH ST	HWY 1/GUADALUPE ST	PIONEER ST	21	010	320	38	12,160	R	AC		79	76	84	$6,797	31,621	LIGHT MAINTENANCE
FIFTH ST	HWY 1/GUADALUPE ST	CAMPODONICO AVE	25	010	364	33	12,012	R	AC		77	74	82	$6,714	31,536	LIGHT MAINTENANCE
													Treatment Total	$15,828		
ALLEY S/O 5TH ST	ALLEY W/O HWY 1	CAMPODONICO AVE	04	010	171	18	3,078	O	AC		84	81	82	$15	767,497	SEAL CRACKS
ALLEY W/O CAMPODONICO AVE	N END	5TH ST	05	010	385	17	6,545	O	AC		81	78	80	$37	739,305	SEAL CRACKS
ALLEY W/O CAMPODONICO AVE	5TH ST	3RD ST	05	020	975	17	16,575	O	AC		82	79	81	$88	747,791	SEAL CRACKS
ALLEY W/O CAMPODONICO AVE	3RD ST	2ND ST	05	030	975	17	16,575	O	AC		82	79	81	$88	747,791	SEAL CRACKS
ALLEY W/O HWY 1	RUBIO ST	6TH ST	06	010	316	17	5,372	O	AC		82	79	81	$29	747,791	SEAL CRACKS
ALLEY W/O HWY 1	6TH ST	5TH ST	06	020	316	17	5,372	O	AC		82	79	81	$29	747,791	SEAL CRACKS
ALLEY W/O HWY 1	5TH ST	2ND ST	06	030	1,968	17	33,456	O	AC		82	79	81	$177	747,791	SEAL CRACKS
													Treatment Total	$463		
							Year 2022 Area Total	164,730					Year 2022 Total	$329,518		

Year: 2023

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment PCI Before	Treatment PCI After	Cost	Rating	Treatment
ALLEY N/O 7TH ST	HWY 1/GUADALUPE ST	RUBIO ST	03	010	150	20	3,000	O	AC		54	47	100	$23,044	10,808	HEAVY REHABILITATION

** - Treatment from Project Selection

Scenarios Criteria:

Scenarios - Sections Selected for Treatment

Interest: .00% Inflation: .00% Printed: 10/14/2019

Scenario: 5yr Budget

Year: 2023

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment PCI Before	Treatment PCI After	Cost	Rating	Treatment
W MAIN ST	SANTA BARBARA ST	CITY LIMITS	75	060	900	37	33,300	A	AC		56	47	100	$255,781	15,637	HEAVY REHABILITATION
												Treatment Total		$278,825		
ALLEY W/O OBISPO ST	ALLEY N/O 4TH ST #2	FENCE S/O ALLEY N/O 4TH ST	07	010	230	26	5,980	O	AC		73	68	77	$18,379	5,440	HEAVY MAINTENANCE
												Treatment Total		$18,379		
ESCALANTE ST	ESCALANTE ST	END	24	020	183	26	4,758	R	AC		79	76	84	$2,660	31,617	LIGHT MAINTENANCE
NINTH ST	HWY 1/GUADALUPE ST	PIONEER ST	44	040	420	44	18,480	R	AC		79	74	83	$10,329	31,618	LIGHT MAINTENANCE
POINT SAL DUNES CI	E END	POINT SAL DUNES WY	56	010	140	38	5,320	R	AC		84	80	88	$2,974	29,793	LIGHT MAINTENANCE
												Treatment Total		$15,963		
PACHECO ST	12TH ST	11TH ST	47	010	438	12	5,256	R	AC		80	83	84	$22	769,208	SEAL CRACKS
PELICAN LN	SURFBIRD LN	SANDPIPER LN	53	010	800	37	29,600	R	AC/AC		96	88	89	$10	12,662,712	SEAL CRACKS
SANDPIPER LN	PACIFIC DUNES WY	PELICAN LN	61	030	500	38	19,000	R	AC/AC		96	88	89	$6	12,662,712	SEAL CRACKS
SECOND ST	HWY 1/GUADALUPE ST	CAMPODONICO AVE	64	020	365	34	12,410	C	AC		82	83	85	$50	797,821	SEAL CRACKS
SECOND ST	CAMPODONICO AVE	TOGNAZZINI AVE	64	030	394	34	13,396	C	AC		82	83	85	$54	797,821	SEAL CRACKS
W MAIN ST	HWY 1/GUADALUPE ST	TOGNAZZINI AVE	75	010	770	32	24,640	A	AC		43	86	87	$37	2,548,315	SEAL CRACKS
												Treatment Total		$179		
					Year 2023 Area Total		175,140				Year 2023 Total			$313,346		

Year: 2024

Street Name	Begin Location	End Location	Street ID	Section ID	Length	Width	Area	FC	Surf Type	Area ID	Current PCI	Treatment PCI Before	Treatment PCI After	Cost	Rating	Treatment
CARLIN DR	PAGALING DR	MAHONEY LN	16	010	890	34	30,260	R	AC		53	44	100	$232,431	11,057	HEAVY REHABILITATION
DEGASPARIS ST	5TH ST	GARRET ST	19	010	208	37	7,696	R	AC		56	47	100	$59,114	10,812	HEAVY REHABILITATION
												Treatment Total		$291,545		
PACHECO ST (SB)	11TH ST	10TH ST	49	010	455	15	6,825	R	AC		82	76	84	$3,815	31,619	LIGHT MAINTENANCE
PIONEER ST	WONG ST	3RD ST	55	015	590	38	22,420	C	AC/AC		89	85	91	$12,531	42,499	LIGHT MAINTENANCE
												Treatment Total		$16,346		
GULARTE LN	11TH ST	END	30	010	867	30	26,010	R	AC		76	78	80	$144	741,354	SEAL CRACKS
PACHECO ST (NB)	10TH ST	11TH ST	48	010	442	14	6,188	R	AC		70	73	75	$44	651,737	SEAL CRACKS
TENTH ST	OBISPO ST	OLIVERA ST	70	020	737	43	31,691	C	AC		66	84	86	$84	1,286,127	SEAL CRACKS
W MAIN ST	TOGNAZZINI AVE	PIONEER ST	75	020	210	32	6,720	A	AC		45	86	87	$11	2,548,315	SEAL CRACKS

** - Treatment from Project Selection

Scenarios Criteria:

Scenarios - Sections Selected for Treatment

Interest: .00% Inflation: .00% Printed: 10/14/2019

Scenario: 5yr Budget

		Treatment Total	$283
Year 2024 Area Total	137,810	Year 2024 Total	$308,174
Total Section Area:	1,331,621	Grand Total	$1,642,927

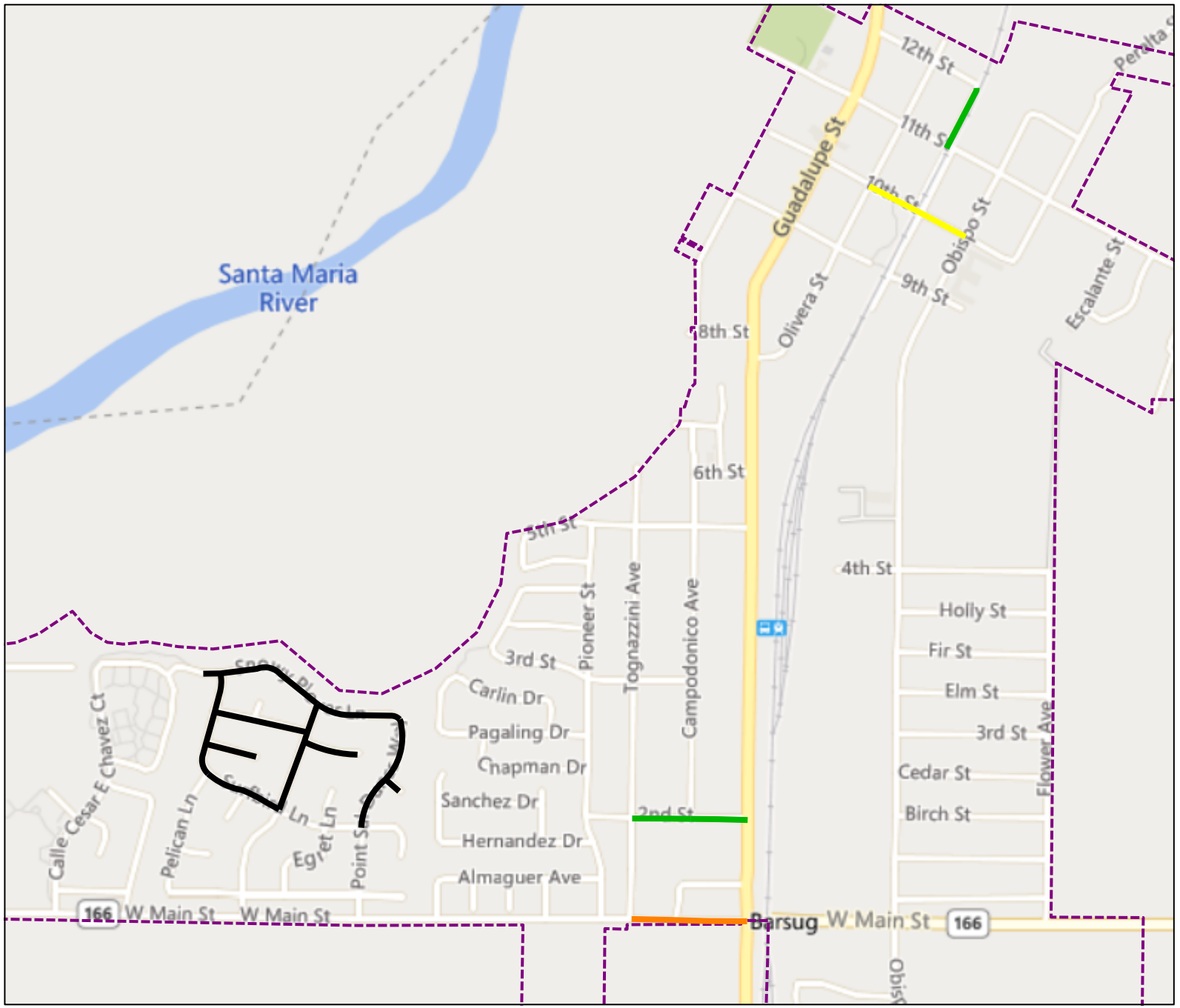
City of Guadalupe

Scenario Treatments

5yr Budget - 2020 Project Period - Printed: 10/15/2019

Feature Legend

- HEAVY REHABILITATION
- LIGHT MAINTENANCE
- LIGHT REHABILITATION
- SEAL CRACKS



0 0.1 0.2 0.3 0.4 Miles

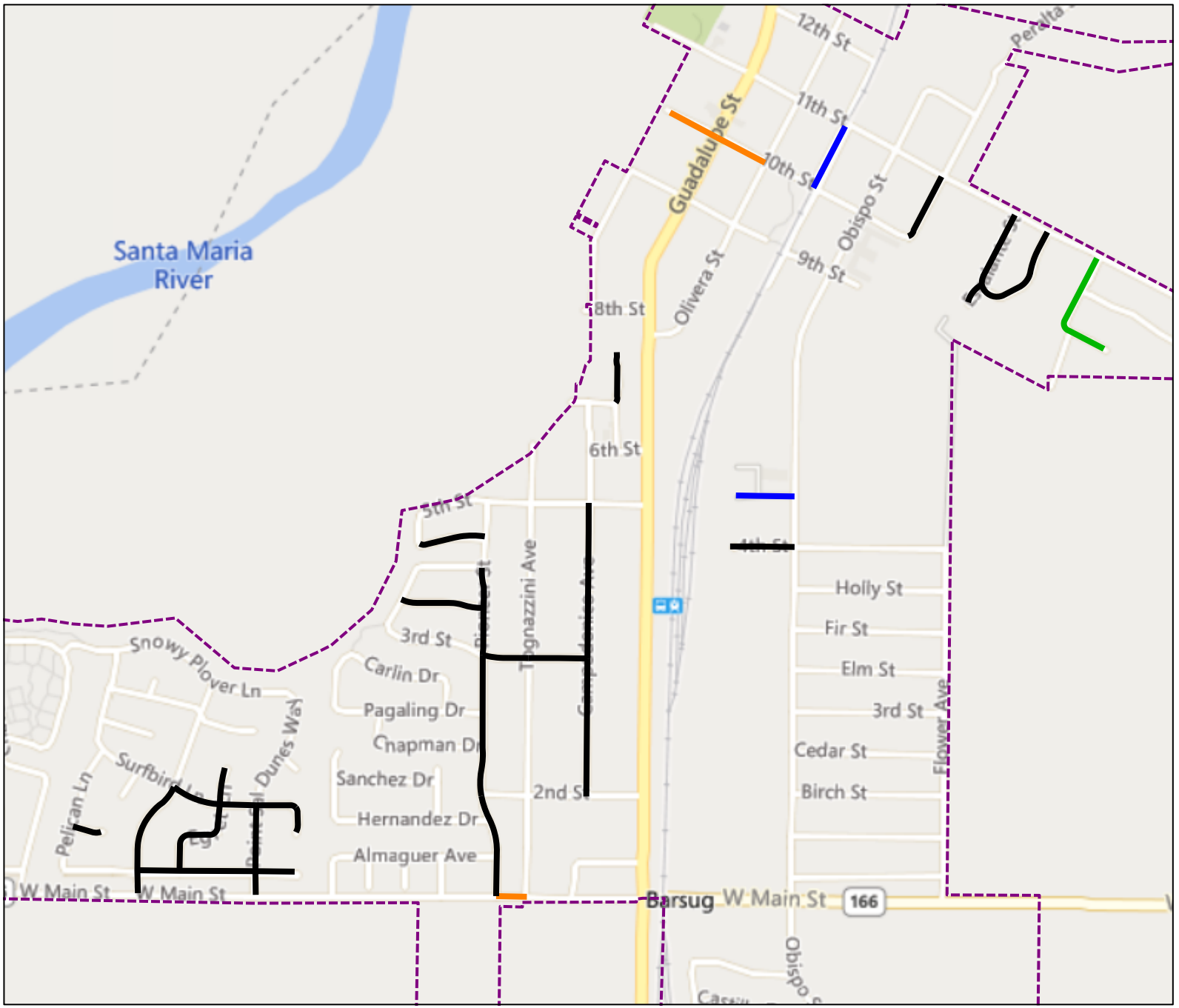
City of Guadalupe

Scenario Treatments

5yr Budget - 2021 Project Period - Printed: 10/15/2019

Feature Legend

- HEAVY MAINTENANCE
- HEAVY REHABILITATION
- LIGHT MAINTENANCE
- SEAL CRACKS



0 0.1 0.2 0.3 0.4 Miles

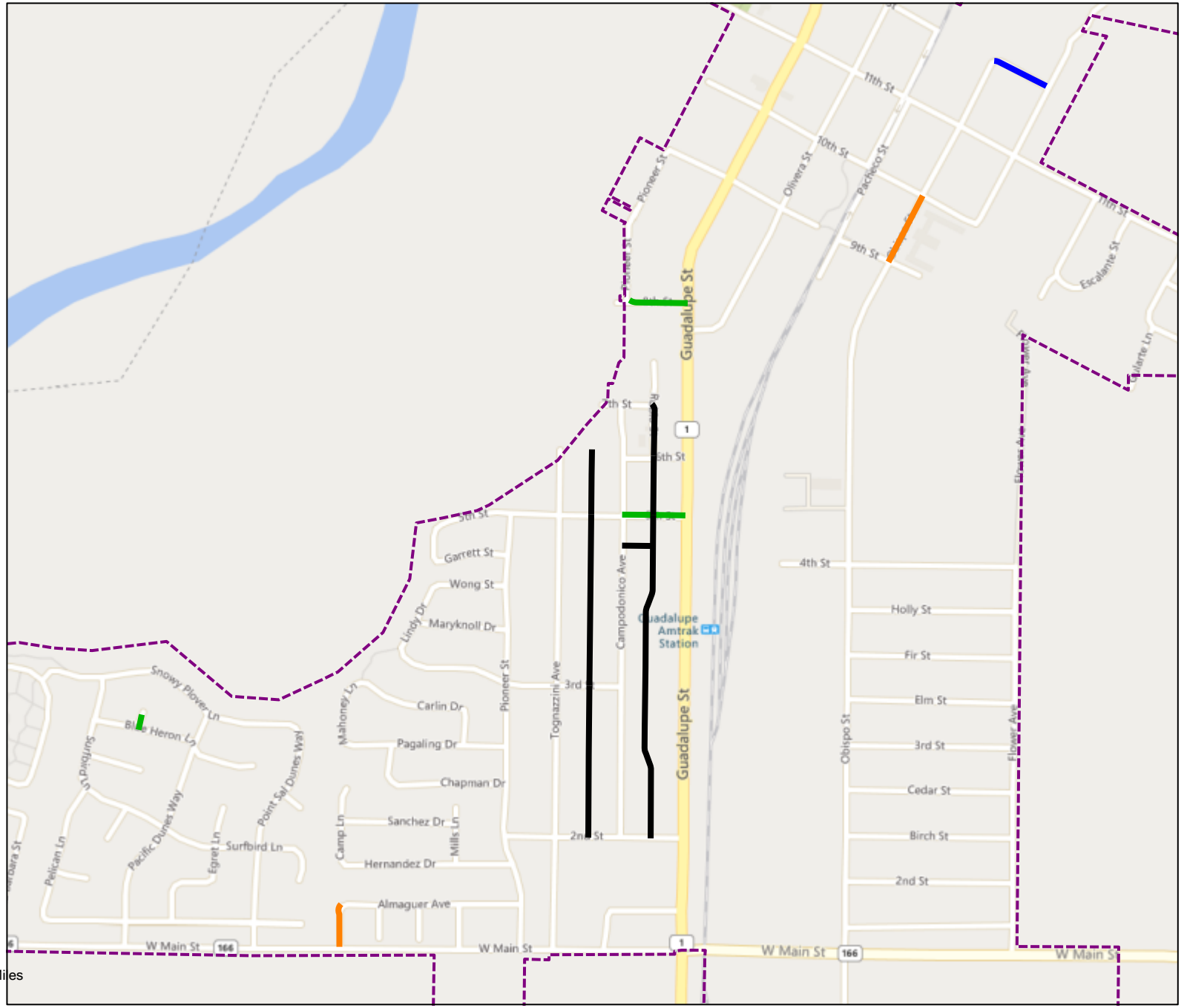
City of Guadalupe

Scenario Treatments

5yr Budget - 2022 Project Period - Printed: 10/15/2019

Feature Legend

- HEAVY MAINTENANCE
- HEAVY REHABILITATION
- LIGHT MAINTENANCE
- SEAL CRACKS



0 0.1 0.2 0.3 0.4 Miles

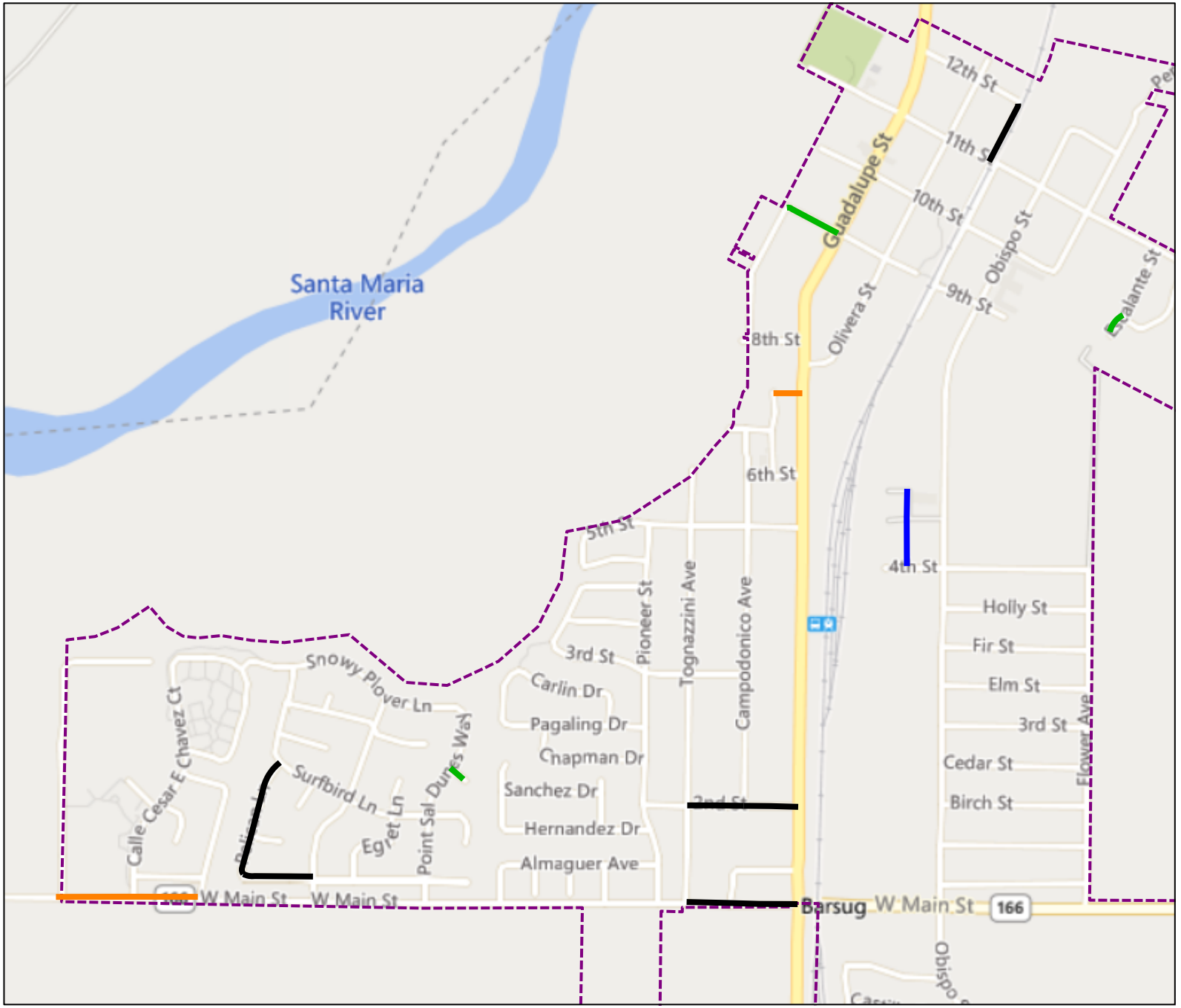
City of Guadalupe

Scenario Treatments

5yr Budget - 2023 Project Period - Printed: 10/15/2019

Feature Legend

- HEAVY MAINTENANCE
- HEAVY REHABILITATION
- LIGHT MAINTENANCE
- SEAL CRACKS



0 0.1 0.2 0.3 0.4 Miles

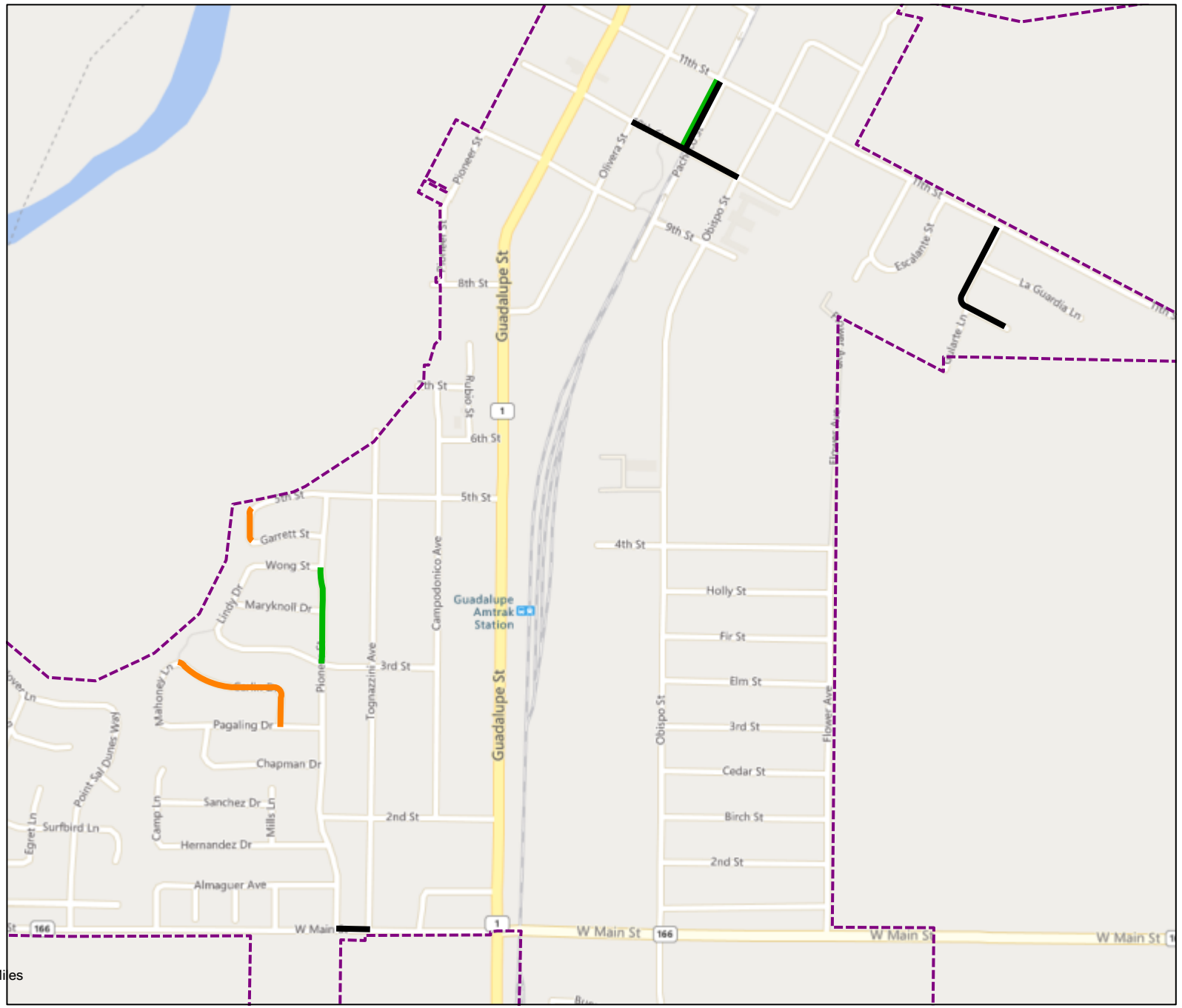
City of Guadalupe

Scenario Treatments

5yr Budget - 2024 Project Period - Printed: 10/15/2019

Feature Legend

- HEAVY REHABILITATION
- LIGHT MAINTENANCE
- SEAL CRACKS



0 0.1 0.2 0.3 0.4

Miles

Increase PCI by 5

($1.3 Million over 5 Years)

- Pavement Network Condition Lane Miles
- Network Condition Summary
- Cost Summary

Target-Driven Scenarios
Pavement Network Condition Lane Miles

Interest: .00% Inflation: .00% Printed: 10/14/2019

Scenario: Increase PCI by 5 79-84

Objective: Minimum Network Average PCI Target: Overall 84

Annual budget needs to meet target objectives

Year	Arterial	Collector	Res/Loc	Other	Preventative Maintenance	Total
2020	$342,224	$1,661,000	$674,302	$3,343	$344,185	$2,680,869
2021	$0	$244,946	$1,023,254	$0	$1,881	$1,268,200
2022	$0	$189,555	$437,558	$463	$438,021	$627,576
2023	$256,750	$49,604	$438,611	$0	$256,753	$744,965
2024	$150,778	$63,279	$1,185,956	$23,082	$63,383	$1,423,095

Average Yearly Total: $1,348,941
Grand Total: $6,744,705

Pavement Network prior to treatments in lane miles.

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	71	6.2%	0.8%	19
Collector	67	7.2%	5.8%	24
Other	78	2.8%	0.0%	26
Residential	82	60.4%	7.8%	32

Pavement Network after schedulable treatments applied in lane miles.

2020

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	79	7.1%	0.0%	19
Collector	88	13.4%	0.4%	24
Other	79	2.8%	0.0%	26
Residential	84	62.0%	6.2%	32

2021

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	77	5.8%	0.0%	18
Collector	86	14.3%	0.4%	24
Other	77	2.5%	0.0%	25
Residential	85	64.0%	2.6%	32

Pavement Network after schedulable treatments applied in lane miles.

2022

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	74	5.8%	0.0%	17
Collector	86	14.4%	0.4%	24
Other	77	2.5%	0.0%	24
Residential	85	64.0%	3.4%	32

2023

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	78	6.7%	0.0%	19
Collector	84	14.4%	0.4%	24
Other	75	2.5%	0.1%	23
Residential	85	64.8%	3.3%	32

2024

Functional Class	PCI	Percentage of the Network in Very Good Condition	Percentage of the Network in Poor or Very Poor Condition	Remaining Life
Arterial	76	8.0%	0.0%	18
Collector	84	14.4%	0.4%	24
Other	75	2.6%	0.0%	23
Residential	86	67.2%	0.9%	33

Scenario: Increase PCI by 5 79-84

Objective: Minimum Network Average PCI Target: Overall 84

Projected Network Average PCI by year

Year	Never Treated	With Selected Treatment
2020	78	84
2021	76	84
2022	74	84
2023	72	84
2024	70	84

Percent Network Area by Functional Classification and Condition Class

Condition in base year 2020, prior to applying treatments.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	6.2%	7.2%	60.4%	2.8%	76.7%
II / III	2.6%	2.9%	3.0%	0.3%	8.9%
IV	0.8%	5.8%	7.8%	0.0%	14.4%
Total	9.7%	16.0%	71.2%	3.1%	100.0%

Condition in year 2020 after schedulable treatments applied.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	7.1%	13.4%	62.0%	2.8%	85.4%
II / III	2.6%	2.1%	3.0%	0.3%	8.0%
IV	0.0%	0.4%	6.2%	0.0%	6.6%
Total	9.7%	16.0%	71.2%	3.1%	100.0%

Condition in year 2024 after schedulable treatments applied.

Condition Class	Arterial	Collector	Res/Loc	Other	Total
I	8.0%	14.4%	67.2%	2.6%	92.2%
II / III	1.7%	1.1%	3.1%	0.5%	6.5%
IV	0.0%	0.0%	0.9%	0.0%	0.9%
V	0.0%	0.4%	0.0%	0.0%	0.4%
Total	9.7%	16.0%	71.2%	3.1%	100.0%

Target-Driven Scenarios - Cost Summary

Interest: 0% Inflation: 0% Printed: 10/14/2019

Scenario: Increase PCI by 5 79-84

Objective: Minimum Network Average PCI Target: Overall 84

Year		Rehabilitation	Preventive Maintenance		Total Cost	Deferred
2020	II	$0	Non-Project	$344,185	$2,680,869	$2,840,566
	III	$121,694	Project	$0		
	IV	$2,214,990				
	V	**$0**				
	Total	**$2,336,684**				
	Project	$0				
2021	II	$0	Non-Project	$1,881	$1,268,200	$2,083,258
	III	$0	Project	$0		
	IV	$1,266,319				
	V	**$0**				
	Total	**$1,266,319**				
	Project	$0				
2022	II	$0	Non-Project	$438,021	$627,576	$2,387,341
	III	$0	Project	$0		
	IV	$189,555				
	V	**$0**				
	Total	**$189,555**				
	Project	$0				
2023	II	$0	Non-Project	$256,753	$744,965	$2,214,923
	III	$0	Project	$0		
	IV	$488,212				
	V	**$0**				
	Total	**$488,212**				
	Project	$0				
2024	II	$150,778	Non-Project	$63,383	$1,423,095	$1,289,309
	III	$0	Project	$0		
	IV	$238,638				
	V	**$970,296**				
	Total	**$1,359,712**				
	Project	$0				

Summary

Functional Class	Rehabilitation	Prev. Maint.
Arterial	$647,440	$102,312
Collector	$2,069,765	$138,619
Other	$23,044	$3,844
Residential/Local	$2,900,233	$859,448
Total:	$5,640,482	$1,104,223

Grand Total: $6,744,705

Appendix C
Definitions

DEFINITIONS

This section is intended to define important pavement design acronyms and terms used when discussing a Pavement Management System (PMS).

GENERAL TERMS

PMS - Pavement Management System - A program to aid in tracking the condition of roads and a means to help quantify the cost of maintaining the roads in a given area.

TI - Traffic Index - Cars and light trucks have little impact on the pavement structure. Larger/Heavier trucks have very significant impacts on the pavement due to the high axle weights. The total EALs is converted into a design Traffic Index (TI). The design TI is the total number of EALs that the pavement will support before it begins to fail, regardless of the passage of time. Normally for a new pavement, the EALs over a 20_year period are used. For rehabilitation procedures such as overlays, 10 years is generally used.

PCI - Pavement Condition Index - A rating scale for the condition of a road segment. 100 represents no defects and recent major rehabilitation.

CRITICAL PCI - The PCI value at which the rate of loss increases with time, or the cost of applying a maintenance treatment increases significantly.

CLS / FC - Functional Classification is the process by which streets and highways are grouped into classes, or systems, according to the character of traffic service that they are intended to provide. There are three highway functional classifications: arterial, collector, and local roads. All streets and highways are grouped into one of these classes, depending on the character of the traffic.

Arterials - provide the highest level of service at the greatest speed for the longest uninterrupted distance, with some degree of access control.

Collectors - provide a less highly developed level of service at a lower speed for shorter distances by collecting traffic from local roads and connecting them with arterials.

Residential/Local - consists of all roads not defined as arterials or collectors and primarily provides access to land with little or no through movement.

- (*Excerpted from the U.S. Department of Transportation, Federal Highway Administration web site on "Functional Classification".)*

EMULSION - A chemical added to water and asphalt that keeps the asphalt in a stable suspension in the water.

AC - Asphaltic Concrete - A plant mixed asphalt binder (asphalt cement that is classified according to the Standard Specification for Performance Graded Asphalt Binder) and aggregate (rocks) thoroughly mixed and compacted into a mass.

PCC - Portland Cement Concrete

OVERLAY - The placement of asphaltic concrete mix over an existing asphaltic concrete or portland cement concrete surface.

Light Overlay - would include any overlay of less than 2 inches of asphalt.

Heavy Overlay - is a thicker layer of asphalt and might include such items/operations as, but not limited to fabric, milling/grinding and reconstruction.

PREVENTIVE MAINTENANCE - Provides budget dollars for localized pavement repairs such as digouts and crack filling.

SLURRY SEAL - Includes a graded aggregate along with emulsion and water. Generally squeegeed and generally consists of two layers.

REFLECTIVE CRACKING - Cracks that occur in new "thin" overlays that are identical to the cracks that were present in the existing pavement.

ALLIGATOR CRACKING - Alligator or fatigue cracking is a series of interconnecting cracks caused by fatigue failure of the asphalt concrete surface under repeated traffic loading. Cracking begins at the bottom of the asphalt surface (or stabilized base) where the stress and strain are highest under a wheel load. The cracks propagate to the surface initially as a series of parallel longitudinal cracks. After repeated traffic loading, the cracks connect, forming many sided, sharp-angled pieces that develop a pattern resembling chicken wire or the skin of an alligator. Alligator cracking occurs only in areas subjected to repeated traffic loading, such as wheel paths. (Pattern-type cracking that occurs over an entire area not subjected to loading is called "block cracking," which is not a load-associated distress.)

BLOCK CRACKING - Block cracks are interconnected cracks that divide the pavement into approximately rectangular pieces. Block cracking is caused mainly by shrinkage of the asphalt concrete and daily temperature cycling (which results in daily stress/strain cycling). It is not load-associated. Block cracking usually indicates that the asphalt has hardened significantly. Block cracking normally occurs over a large portion of the pavement area, but sometimes will occur only in non-traffic areas. This type of distress differs from alligator cracking in that alligator cracks form smaller, many-sided pieces with sharp angles. Also, unlike block, alligator cracks are caused by repeated traffic loadings, and are therefore found only in traffic areas (i.e., wheel paths).

LONGITUDINAL / TRANSVERSE CRACKING - Longitudinal cracks are parallel to the pavement's centerline or laydown direction. Transverse cracks extend across the pavement at approximately right angles to the pavement centerline or direction of laydown. These types of cracks are not usually load-associated.

WEATHERING & RAVELING - Weathering and raveling is the wearing away of the pavement surface due to a loss of asphalt or tar and dislodged aggregate particles. These distresses indicate that either the asphalt binder has hardened appreciably or that a poor quality mixture is present. In addition, raveling may be caused by certain types of traffic, i.e., tracked vehicles. Softening of the surface and dislodging of the aggregates due to oil spillage are also included under raveling.

BUMPS & SAGS - Bumps are small, localized, upward displacements of the pavement surface. They are different from shoves in that shoves are caused by unstable pavement. Sags are small, abrupt, downward displacements of the pavement surface. If bumps appear in pattern perpendicular to traffic flow and are spaced at less than 3 m (10 ft), the distress is called corrugation. Distortion and displacement that occur over large areas of the pavement surface causing large and/or long dips in the pavement should be recorded at “swelling.”

RUTTING / SHOVING - A rut is a surface depression in the wheel paths. Pavement uplift may occur along the sides of the rut, but, in many instances, ruts are noticeable only after a rainfall when the paths are filled with water. Rutting stems from a permanent deformation in any of the pavement layers or subgrades, usually caused by consolidated or lateral movement of the materials due to traffic load.

Shoving is a permanent, longitudinal displacement of a localized area of the pavement surface caused by traffic loading. When traffic pushes against the pavement, it produces a short, abrupt wave in the pavement surface. This distress normally occurs only in unstable liquid asphalt mix (cutback or emulsion) pavements.

PATCHING & UTILITY CUTS - A patch is an area of pavement that has been replaced with new material to repair the existing pavement. A patch is considered a defect no matter how well it is performing (a patched area or adjacent area usually does not perform as well as an original pavement section). Generally, some roughness is associated with this distress.

POTHOLES - Most often are structurally related distresses and should not be confused with raveling and weathering.

PAVEMENT PRESERVATION - Applying the Right Treatment to the Right Pavement at the Right Time using the Right Materials.

R-VALUE - A test to evaluate the base, subbase and subgrades of an area to be used in pavement designing for thickness of asphalt.

ESAL - The impact of trucks is measured in equivalent single
18,000 pound axle loads (EALs).

STREETSAVER DEFINITIONS

MANAGEMENT SECTION - This is used to maintain an inventory of all the roads and road sections in your jurisdiction.

EVENTS – This provides for viewing and maintaining of Events or changes that have been made on a management section. The Events that are included are:

- Management Section Creation.
- Results from Maintenance and Rehabilitation treatments that have been applied to the Management Section.
- Results from Visual Inspections of Management Sections.
- Listing of changes/edits of information on a Management Section.

DETERIORATION CURVE - This provides a graphical representation of the current pavement condition index and the historical PCIs for each section of road in your jurisdiction.

MAINTENANCE/REHABILITATION - This is used to review the proposed maintenance, new maintenance, and rehabilitation for any road section in your jurisdiction.

BRANCH - Generally a road name or a road name with a direction of travel.

SECTION - Usually a branch or road is large and needs to be divided into smaller pieces to maintain. These smaller pieces are labeled as “sections” and designated with a number and a beginning and ending location.

DISTRESSES - Defects found in asphalt concrete pavements or portland cement concrete. These defects degrade the condition of the road.

RATING - The rating is the weight cost - effectiveness ratio of the recommended treatment.

% OF ENVIRONMENT - The percentage of the pavement distress in a management section that is an environment related distress.

% LOAD RELATED - The percentage of the pavement distress in a management section that is load related distress (caused by excessive weight on the pavement surface).
% OTHER - Is the percentage of the pavement section that is not a load related or environment related distress.

ACTIVE - Indicates whether or not the current record is active.

AREA - Contains the area of a section in square feet. This is automatically calculated using the values that are entered in the Length and Width fields. However, if the section is irregularly shaped the area can be entered by the user.

AREA ID - Is an optional, jurisdiction defined field to identify the area in which the section is located. For example, each neighborhood or subdivision, or each geographic type (mountain, valley, coast, etc.) in the jurisdiction may be assigned a letter of the alphabet.

BASE BUDGET - Provides an area for you to enter the dollar amount of your base budget.

BASE BUDGET INCREASE FACTOR - Stores the percent that the base budget will increase each year.

BASE PM SPLIT - Percent of the base budget that has been set aside for preventive maintenance.

BEGINNING LOCATION - Identifies the point that defines the beginning of the section. This is generally the name of a cross road or other landmark.

CONDITION - Column lists the condition levels (2-5) that require stop-gap treatments.

COST/ SQ YD - Indicates the cost per square yard of road for the suggested treatment.

CURRENT PCI - Calculated from either a visual inspection or a maintenance treatment.

DESCRIPTION - Displays a description of the item named in the previous column in a grid.

DISTRESS - Contains the type of distress present on a section of a road.

END LOCATION - Identifies the point that defines the end of the section. This is generally the name of a cross road or other landmark.

EVENT ACTIVE - Indicates whether an Event is currently part of the active history for the current Section.

EVENT PCI - The PCI after the selected Event occurred.

EVENT TRANSACTION TYPE - Includes: Creation, Inspection, Treatment, Split, Combine, Attribute Change and Core Data Change.

EVENT VALID - Indicates if an Event can be activated and made part of the valid events for the current section.

FUNDING SOURCE - Is an optional, jurisdiction defined field to identify the funding source for the section; an example might be G for general fund.

GENERAL CODE - Is an optional, jurisdiction defined field used to identify sections of pavement sharing common characteristics, i.e., drainage type.

INFLATION RATE - Is the inflation used throughout your jurisdiction. You may wish to consult your financial department with this value.

INSPECTION AREA - Is the total area of the inspection unit.

INTEREST RATE - Contains the interest rate used throughout your jurisdiction.

LIFE EXTENSION - Is the number of years that a maintenance treatment extends the life of a pavement surface.

MAINTENANCE DATE - Displays the date the maintenance was completed.

MANAGEMENT UNIT - Relates a project to a management unit.

MILEPOSTS - Display the beginning and ending points of a management section.

NEW PCI - Stores the PCI value that was calculated after a treatment was applied.

NUMBER OF SURFACE SEALS BEFORE OVERLAY - Displays the recommended number of surface seals before the application of an overlay.

OLD PCI - Displays the pavement condition index before a treatment was applied.

OTHER - Displays the weighting factor applied to management sections with functional classes other than arterial, collector, and residential.

OVERLAY - Displays the overlay code that corresponds to an overlay procedure.

OVERLAY CODE - Is an identifier for the treatment type; use one of the six codes from the pop-up list that appears when this is activated.

PCI CAP - Stores the maximum PCI value that will be included in needs and scenario calculations. If a PCI value is larger than the PCI Cap value, it will not be included.

PCI EFFECTIVENESS CUT-OFF - Contains the minimum PCI value used in calculating the area under the projected performance curve. That area is used in ranking sections needing work, and the area below the PCI Cut-Off value is not included in that area. It should generally be the lowest PCI value that defines the minimum acceptable condition for all of the pavement types and functional classification groupings.

PCI HIGH - LOW > 25 - Is marked if the difference between the high and low PCI values is greater than 25.

PCI HIGH VALUE - Is the maximum PCI value for an inspection unit used in the last PCI calculation for a management unit.

PCI LOW VALUE - Is the minimum PCI value for an inspection unit used in the last PCI calculation for a management unit.

PM% - Scenarios based on a yearly budget, this column stores the percent that has been set aside for preventive maintenance.

REPLACEMENT COST - Is the cost per square yard to install a new pavement surface.

RESIDENTIAL $ - Indicates the cost of a stop-gap treatment per square yard when applied to a road with a residential functional class and a given condition.

ROAD ID - Contains a two-character identifier that was assigned to the road. The combination of Road Number, Road Name, and Road ID must be unique for each road section.

ROAD NAME - Displays the name of the road that corresponds to the road number and road ID. The combination of Road Number, Road Name, and Road ID must be unique for each road section.

ROAD NUMBER - Contains the number that was assigned to a road. The combination of Road Number, Road Name, and Road ID must be unique for each road section.

SECTION ID - Is an identifier that is unique for each section of a given street. Note that the Street ID and the Section ID combined describe the individual section. Therefore, that combination must be unique. The same Section ID can be reused as long as it is used in conjunction with a different Street ID each time.

SEGMENT LENGTH - Is the length in feet of the management section.

SELECT MANAGEMENT SECTIONS - Allows you to calculate PCI values based on selected management sections. If this button is marked, the management sections that have had records updated since the last calculations are displayed in a grid. Select the management sections you want included in the calculations from this grid.

SPECIAL - Check box is marked if the displayed inspection unit is non-representative of a section as a whole.

SPECIAL UNIT - The information will either be Y or blank. Y is an indication that this inspection unit is in some way non-representative of the section as a whole, and would receive a different maintenance/rehabilitation treatment from the rest of the section.

STANDARD INSPECTION UNITS - Is the typical number of inspection units that would be used for a particular management section.

STOP-GAP APPLICATION INTERVAL - Indicates the number of years between the applications of stop-gap treatments.

STREET ID - Is an identifier that is unique for each street. The Street ID usually bears some similarity to the actual street name.

STREET NAME - Is the full name of the street including “Street”, “Way”, “Court” etc.

TREATMENT - Contains the type of treatment the road received or will receive.

TREATMENT COST - Is an optional field giving the cost in dollars and cents of the treatment.

UNIT OF MEASURE - Displays the units of measure used to measure an item.

UNIT PRICE - Displays the price paid for an inventory item.

VISUAL PCI - Used to identify PCI calculations that have been determined based upon a visual inspection. If this check box is blank, then the PCI was extrapolated based upon the maintenance treatment that has been applied to a management section.

WEIGHTING FACTORS - Section displays the weighting factors established by your jurisdiction for the functional classes.

YEAR OF MAINTENANCE - Stores the proposed year of a treatment.

YEARS BETWEEN CRACK SEALS - Displays the number of years between the application of crack seals for the functional class with a specific severity.

YEARS BETWEEN SURFACE SEALS - Displays the recommended number of years that should come between surface seal application for the functional class with the indicated severity.

YEARS TO CALCULATE - Stores the number of years you want to include in the Budget Needs calculation. The number of years cannot be less than 5 or more than 20.

REPORT DEFINITIONS

ZONES - Geographical areas of the city defined by city staff to aid in the development of a maintenance plan for residential roads.

CL - Centerline Mile - a measuring of the length of a road regardless of the width of the road.

LM - Lane Mile - a measurement of the length of all the lanes for a given FC or area.

ACTION / TREATMENT - A proposed type of rehabilitation work that should be used on a given road segment, based on PCI, FC and engineering evaluation.

ANNUAL BUDGET - The amount of money that is available each year to be used for pavement maintenance. These funds can come from various sources and can vary from year to year, although it is generally a fixed figure.