2017

Pavement Management System Update

Working to Improve our Streets and Alleys

City of Marysville
526 C Street
Marysville, CA 95901

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INTRODUCTION

The City of Marysville is responsible for the maintenance and rehabilitation of approximately 10.4 million square feet of pavement within the City boundaries, and in order to best serve the community, the City has implemented a Pavement Management Program (PMP) with the overall goal of making the most effective use of the funding available to preserve and upgrade the overall condition of the streets in Marysville. This program allows the City to evaluate and prioritize the maintenance of the pavement infrastructure as well as develop cost-effective treatment strategies and schedules.

The City of Marysville has historically maintained a Pavement Management System (PMS) to evaluate the condition of the City streets and aid in allocating funds for repairs and maintenance. The first study was performed by CHEC Engineering in 1994, and it was determined that the cost of repairs and maintenance from that study totaled $2.2 million. A five-year plan for road maintenance and repairs was developed with an estimated annual cost of roughly $250,000, including an additional $858,000 of work that was not scheduled within that five-year period due to lack of funding. The second study was performed in 2001 by the City of Marysville staff, and at that time the total cost had risen to $6.25 million due to deterioration and cost of construction. The total anticipated cost was increased to $3,780,000 over a five-year period, and the only possible funding for these repairs came from the Gas Tax Fund Balance and the State Transportation Improvement Program (STIP). These funding sources did not provide adequate revenue to maintain the five-year program but did provide funding to repair several of the worst streets identified in the PMS. This most recent update of the PMS was concluded last year using grant funds from the Sacramento Area Council of Governments (SACOG) to update the PMS/PMP in preparation for using the funds generated through the Senate Bill 1 Gas Tax Revenue and the declining road tax revenue. The update was conducted through a survey process completed by city staff from the City of Maryville and the consultant City Engineer, MHM Incorporated.

The trend through the updates of the PMS over the years has been the deterioration of the streets in the residential area of East Marysville which is the area east of the railroad tracks and mostly north of State Route 20. A side by side comparison of the PMS updates is difficult to make because of the changes in policies used for determining repair costs for types of defects reported and the cost of construction, but despite many sections being repaired or replaced since the 2001 study, the system-wide Pavement Condition Index (PCI) has dropped from 67 to 55. Several sections that had a low to moderate PCI from the previous study have dropped below a PCI of 25 because not enough funding was available to sustain a program for sealing and stabilizing the pavement sections.

2017 PAVEMENT MANAGEMENT STUDY

An updated pavement management study is vital in assisting the City in planning its street maintenance and repair programs since the information from previous studies becomes less valuable over time, in part because roads deteriorate differently due to factors such as weather, traffic from heavy vehicles, and ongoing repairs and maintenance. The City received a grant from the Sacramento Area Council of Governments (SACOG) to update their PMS/PMP in anticipation of new funding sources becoming available. This study was conducted using Micro Paver software, which was written by the Army Corp of Engineers and purchased through Colorado State University. The engineering staff from MHM spent several months during late summer and early fall inspecting each road segment for condition and accessibility improvements; all defects were entered into Micro Paver and the other segment information into the notes. Micro Paver recorded all defects of the roads and used this information to calculate the Pavement Condition Index (PCI), a rating system that the Corps uses for paved surfaces. The PCI is calculated based on the size of the road segment, the type of material the road is made from, and the size and severity of the defects of that segment. The PCI rating is scaled from zero being the worst to one hundred being the best and is the industry standard for ranking pavement sections within a PMS or PMP. Data from previous studies is used more for observing the rate of deterioration of the pavement sections and evaluating the streets that have been repaired or reconstructed.

To conduct the evaluation for the PMP within the PMS the streets were broken down into networks which refer to the type of road surface represented. Networks are very broad, with the two networks being streets and alleys. The networks were then broken down into branches, which are more specific; in this case they were the full streets (e.g., 9th Street is one branch). The branches were then broken down into sections, or segments, of a branch or street. This is the most specific category, and all inspections were done at this section level, one segment at a time, with a branch or street broken down into multiple sections, such as 9_E_F, which represents the segment of 9th Street between E Street and F Street.

After importing and recording the updated field data as well as identifying the PCI for every street segment, a price has been set to every policy needed to estimate the cost of bringing the streets up to a good condition. In this study, the following policies were used:

PCI less than 25: a PCI of less than 25 indicates a high severity of distress to the pavement and segment. Usually, the segments with a PCI of less than 25 have a high severity of alligator cracking on a large portion of the street segment. Since there is a high number of repairs required for this extent of damage, any segment with a PCI of less than 25 assumes repair for the entire segment.

PCI 25-50: a PCI between 25-50 indicates a road that is generally in poor condition but not as severe as the category above. This category is broken down into two parts. The first part is those roads that have more than 20% of the area covered in alligator cracking. This policy calls for the reconstruction of the full segment. In response to another cost analysis run, those streets that have a PCI between 25-50 but cost less to reconstruct than to fix the defects have also been put into this category. The second part of this category is those streets that have less than 20% of the area covered in alligator cracking. For those streets, the individual defects will be repaired according to the table.

PCI greater than 50: a PCI greater than 50 indicates a road segment in fair to good overall condition. In this segment the individual defects will be repaired. The repair costs are according to the table below. This category often has defects with low severity, so it will be best to fix defects such as cracking with crack sealing and then maintain the condition of the streets. For this category the primary focus should be maintaining the streets through ongoing maintenance, seal coating, and slurry seal.

On the streets and alleys with a PCI greater than 50 it is assumed that many of the imperfections will be covered by the implementation of the PMP maintenance, and because of this, many of the low severity defects are assumed to have a "no action policy" in the segments with a PCI greater than 50. For Marysville 50.5% of the streets have a PCI greater than 50 but only account for 5.7% of the total system structural repair cost. This results in a lower overall program repair cost because it defers or avoids more expensive repairs or reconstruction of the pavement section.

REPAIR OF DEFECTS		
DEFECT	PROPOSED REPAIR	ESTIMATED COST
PCI<25/PCI 25-50 >20% Alligator Cracking (Street)	Rebuild Full Section	$3.50 per square foot
PCI<25/PCI 25-50 >20% Alligator Cracking (Alley)	Rebuild Full Section	$4.00 per square foot
Alligator Cracking - High Severity	Remove & replace AC 6" Deep	$18 per square foot
Alligator Cracking - Moderate Severity	Remove & replace AC 4" Deep	$15 per square foot
Edge Cracking	Grind and Repair AC - 3 feet wide	$20 per lineal foot
Potholes	Repair 2' X 2'	$50 Each
Patches/Utility Cuts	Remove & Replace AC - 4" Deep	$15 per square foot
Longitudinal or transverse cracking	Crack seal	$0.20 per lineal foot
Block Cracking	Crack seal	$0.20 per lineal foot
Rutting, shoving, bumps, sages, etc.	Grind / AC leveling course	$3 per square foot
Preventative for PCI > 75	Seal Coat	$0.75 per square foot
Preventative for PCI 50-75	Slurry Seal	$1.50 per square foot

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PAVEMENT DEFECTS

Micro Paver data entry is broken down into 20 different types of defects, and the percentage of the overall segment area and severity of these defects is used to calculate the PCI. Each defect has a different effect on the PCI and how it is calculated. Out of the 20 types of defects, only 11 were common to the streets found in Marysville. They are as follows:

1) Alligator Cracking – interconnected cracks caused by fatigue failure of pavement from the repeating traffic loads.

Example of: Medium severity localized alligator cracking - C St between 2nd St and 3rd St (PCI 26)

Example of: Medium severity alligator cracking - Harris St between 19th St and Hall St (PCI 18)

2) Block Cracking – Interconnected cracks usually caused when pavement shrinks and daily temperature cycling. They look like alligator cracking except the blocks are much larger. They also appear to look like interconnected longitudinal and traverse cracks.

Example of: Block Cracking on Glen St between Rideout St and 17th Street (PCI 20)

3) Bumps/Sags – The rising or lowering of a section of pavement, usually a result of weathering or traffic moving the pavement material.

Example of: Raising pavement at the culvert at the intersection of I St and 12th St (PCI 34)

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4) Depression – When a section of pavement is lower than the surrounding pavement. This is due to the settlement of the soil under the pavement.

Example of: Depressions and weathering on 1st ST between C St and D ST (PCI 26)

5) Edge Cracking – Cracks that are near and parallel to the outer edge of pavement and up to 1.5 feet from the edge.

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6) JT Cracking – Similar to Block Cracking and Longitudinal and Traverse Cracking, but it looks straight. Usually appears on an overlay surface.

7) Longitudinal and Traverse Cracking (L+T Cracking) – Long cracks that run anywhere from parallel to perpendicular to the road and are usually caused by the weather.

Example of: L+T cracking with Alligator cracking - Huston St near Johnson St (HUS_JOH_22: PCI 11)

8) Patch/Utility Cut – An area of pavement that has been replaced with newer material, often from utility repairs. The medium or high severity ones show significant settlement and/or deterioration of the patch.

Example of: Failing utility trench patch – 12th near E St (12TH_E_F: PCI 53)

9) Potholes – An isolated area where the pavement was lost, resulting in the pavement having a depression or hole.

Example of: Pothole on Freeman St at the intersection with 13th St (PCI 11)

10) Raveling – The coarse aggregate has been lost from the pavement. Usually a result of damaged asphalt mixture or surface stripping from mechanical equipment that has driven over the surface.

Example of: High severity raveling - Sweezy St between 16th St and 17th St (PCI 8)

11) Weathering – The pavement surface is wearing away due to the loss of asphalt binder.

Example of: Combination of weathering and high severity alligator cracking E19th St at the intersection with Sampson St, showing (PCI 8)

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Combinations of all the conditions:

Example of: Potholes, weathering, raveling, cracking, alligator cracking - A_6_4 intersection at 6th (PCI 7)

Example of: High severity raveling, weathering, depression, and pothole, along with medium severity L+T cracking, alligator cracking, and utility cuts - Pine St between 6th St and 7th St showing (PCI 7)

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Pavement Management Plan Approach

An integral part of the analysis and planning for Pavement Management is the Pavement Management System (PMS) that the City created in 2001. The PMS provided a system to combine and collect the street network system. It then made an assessment of the condition of the individual segments and manipulated the data to develop a program to maintain and repair the roads. This update of the PMS provides the City with the most current information as well as the ability to look at what areas have deteriorated the most since the initial study. There are two different approaches that public agencies have adopted for prioritizing repairs and maintenance using this information within a Pavement Management Plan.

The first PMP approach is to focus on the failing sections first by repairing the streets in order of severity and use (for example, starting with the lowest PCI and highest traveled sections and working through the system). Using this method would utilize the PMS ranking starting with the most severely damaged street sections as the first to be repaired. This addresses severely damaged sections first, but costs are higher for the damaged sections because they will require reconstruction of the pavement; this results in a lower percentage of the roads being repaired on a given budget.

This repair-only method also does not take into account the fact that extending the life of existing pavement sections through maintenance practices like sealing the surfaces of good sections before they begin to deteriorate and slurry sealing or overlaying marginal sections will extend the life of more sections of street for the same budget.

The second PMP approach prioritizes the maintenance of the streets in better condition over reconstruction of the failing sections. This method has become more common for public agencies to adopt in the recent years because it allows them to bring more of their streets to higher PCI for less money. By maintaining more road sections in good condition, making them less likely to deteriorate, they avoid the cost of having to reconstruct more sections thereby making the overall cost through the duration of the plan go down. The downside with this approach is that within the reality of limited budgets most agencies aren't able to afford to reconstruct complete road sections after the funds are spent on maintenance, and failing streets with low traffic volumes never receive any improvements.

With this update of the PMS and new PMP, the City of Marysville should take a balanced approach that emphasizes maintaining streets while trying to whittle away at the large number of sections of street within the City with poor pavement sections. Since the 2001 PMS / PMP there have been several sections of streets improved through City and Caltrans projects but not any large-scale maintenance projects beyond seasonal repairs. The annual funds from SB-1 will allow the City to plan annual maintenance projects in combination with other funding sources to tackle the high cost reconstruction projects. In addition, the City PMP will look at repairs of the utilities within the roads to coordinate road construction with large scale utility repair or replacements, limiting utility cuts in in new pavement sections.

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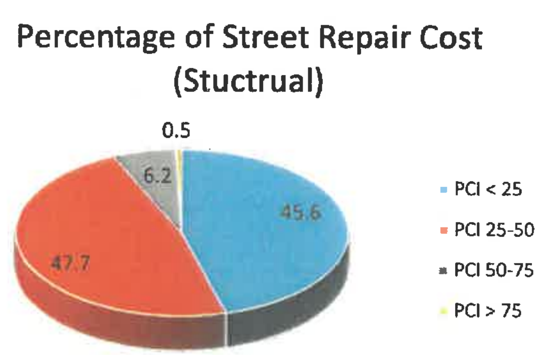
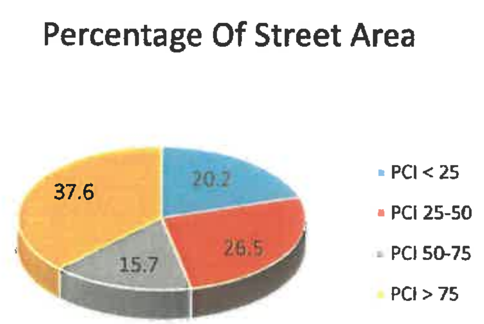
ESTIMATED COST OF REPAIRS

Compared to the three previous Pavement Management Studies done in Marysville, CA the price continues to rise, from $2.22 million in 1994, to $6.25 million in 2001, to $17.4 million in 2017. The cost increase is due to the increase of the unit cost for individual repair costs, as well as the continued deterioration of the streets because the City has not had the funding to implement the desired repairs from the previous studies. This trend in lower system-wide PCI and higher PMP implementation cost will continue until the City receives enough funding to adequately maintain and begin reconstructing the streets. SB-1 is a great start for a change.

Using the repair policies from the PMS and the data collected on pavement conditions, the cost required to repair the structural section (paved section) of the streets is calculated below. These costs are limited to the pavement structural section and do not include the complete street repairs that include repairing damaged curb, gutter, or sidewalk, installing accessible ramps on the corners, or other improvements for pedestrian or bicycle safety that would be incorporated when major repairs are performed on a street segment.

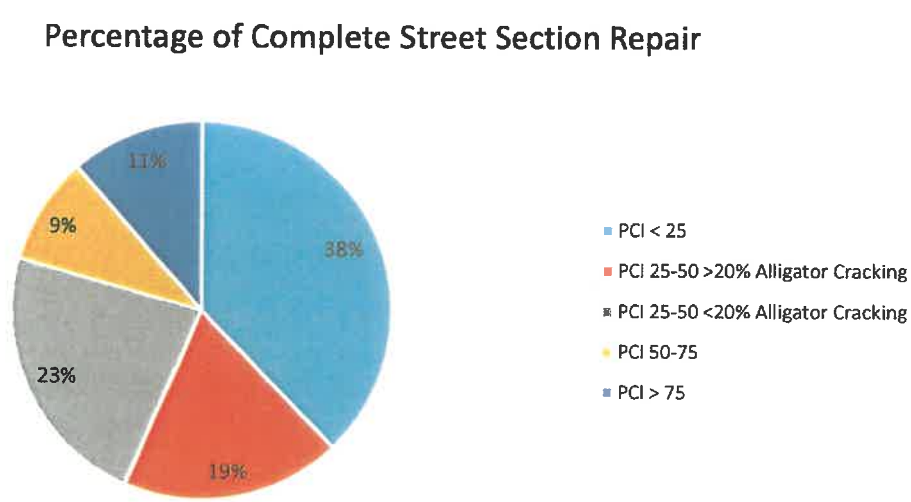




The system-wide repair cost shown in the table below only considers the cost of repairing the structural section of the street. There are more improvement and repair costs associated with actual construction projects repairing the complete street segments, which will increase the cost of implementing the repairs. These costs included in this type of repair expense were "road section repair costs," which include the structural repair costs. For streets it assumes 2 accessible ramp upgrades per segment (assumed 2 per segment instead of 4 to prevent double count), and 250' of curb and gutter repairs per segment, and for alleys it assumes repairing the valley gutter and driveways to the alley. With these assumptions the street repair costs increase from $15.8 to $22.5 million, and the alley repair costs increase to $1.5 to $2.4 million, which increases the overall system repairs costs to $24.9 million.

There are several assumptions and costs built into the total numbers referenced above. For complete street segments it assumes that the price for every ramp costs $3000, and the cost for curb and gutter is $30 per linear foot, with the assumption that every segment requires 250 feet of curb and gutter repairs. For complete alley segments, it assumes that every alley segment requires valley gutter repairs at the cost of $20 per linear foot, and that every segment requires 250 feet of valley gutter repairs. Another assumption is that every alley needs a driveway repair at the cost of $2,500 per driveway, and every alley segment has two driveways.

In addition to the extra costs for repairing the "complete street segments", there are additional costs that factor into the design and construction of the projects. The 2001 PMS cost analysis takes these "road section repair costs" and adds the other costs normally associated with repairs. This analysis used the road section repair costs and added the following multipliers to account for the additional costs: Contingency at 15.0%, Marysville Management and Administration at 1.0%, Geotechnical Investigation at 1.5%, Topographic Surveying at 1.0%, Preliminary Engineering at 0.5%, Design Engineering and Surveying at 7.5%, and Marysville Inspection and Construction Management at 3.0%. With these additional associated design and overhead costs, the complete street repair costs increase to $29.1 million and the alley repair costs increase to $3.1 million, which increases the overall cost to $32.2 million to complete the projects. This total only assumes the cost of repairs needed and does not factor in the cost of maintenance such as seal coating and slurry sealing during the time period it would take to complete all the repairs.



Condition	Gross Area (Square Feet)	Cost of Repairs (Structural Section)	Average Weighted PCI	Cost of Repairs (Complete Street Repairs)	Cost of Repairs With Overhead & Design (Grand Total)
Street Segments Based on PCI Rating					
PCI < 25	2,078,590	$7,230,195	15	$8,499,195	$11,006,458
PCI 25-50 >20% Alligator Cracking	1,038,240	$3,633,840	36	$4,200,840	$5,440,088
PCI 25-50 <20% Alligator Cracking	1,598,200	$3,920,461		$5,135,461	$6,650,421
PCI 50-75	1,568,830	$982,897	60	$2,076,397	$2,688,934
PCI > 75	3,585,275	$77,767	92	$2,561,767	$3,317,489
Total	**9,869,135**	**$15,845,160**	**56**	**$22,473,660**	**$29,103,390**
Alleys Segments Based on PCI Rating					
PCI < 25	285,480	$1,168,320	10	$1,608,320	$2,082,774
PCI 25-50 >20% Alligator Cracking	39,500	$131,600	35	$191,600	$248,122
PCI 25-50 <20% Alligator Cracking	112,460	$193,911		$373,911	$484,215
PCI 50-75	52,500	$37,913	62	$147,913	$191,547
PCI > 75	39,300	$805	90	$60,805	$78,742
Total	**529,240**	**$1,532,549**	**29**	**$2,382,549**	**$3,085,401**
Total System Segments Based on PCI Rating					
PCI < 25	2,364,070	$8,398,515	14	$10,107,515	$13,089,232
PCI 25-50 >20% Alligator Cracking	1,077,740	$3,765,440	36	$4,392,440	$5,688,210
PCI 25-50 <20% Alligator Cracking	1,710,660	$4,114,372		$5,509,372	$7,134,637
PCI 50-75	1,621,330	$1,020,810	60	$2,224,310	$2,880,481
PCI > 75	3,624,575	$78,572	92	$2,622,572	$3,396,231
Total	**10,398,375**	**$17,377,709**	**55**	**$24,856,209**	**$32,188,791**

Prioritization

With costs this significant, the City will not have enough funds to complete the entire street repair program in a five-year period utilizing funds available even if additional funds were found through grants and other transportation funds. Therefore, it will be necessary to prioritize the way that the repairs should be made and continue to protect the investment that has been made in the street repairs made to date while improving the poor sections as quickly as feasible.

PMP MAINTENANCE PROGRAM

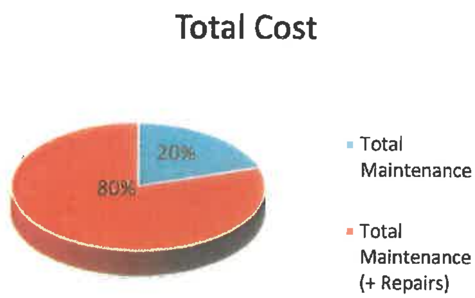
In this PMP, it is assumed that all the pavement segments with PCI greater than 50 will be addressed under maintenance program rather than large scale construction projects. This maintenance program assumes fixing the low severity defects after repairs have been finished, such as crack sealing the cracks and then overlaying them with either seal coating or slurry sealing.

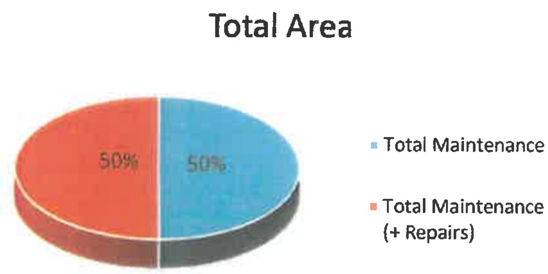
Water is one of the biggest factors in pavement sections deteriorating. If a street is in relatively good condition but has some cracks, water can penetrate through the cracks into the subgrade, making the streets deteriorate quicker. Eventually water penetrating to the subgrade, along with the traffic load causing flexing and cracking, will result in alligator cracking. Other defects such as utility cuts and patches also provide a route for water to penetrate, which is why crack sealing is the first important step of the maintenance program. Crack sealing the cracks in the streets with a relatively flexible asphaltic material will stop the water from penetrating through the surface into the subgrade.

As part of the preventative PMP maintenance program, segments with a PCI greater than 75 are assumed to have seal coating over the whole surface area of the segment every 10 years as preventative maintenance. Segments with a PCI between 50 and 75 are assumed to be slurry sealed as part of the preventative maintenance program.

Approximately slightly less than 50% of the streets have a PCI greater than 50, which means those streets should have preventative maintenance done to them (seal coating and slurry sealing). This maintenance program of adding seal coating and slurry sealing of every street with a PCI greater than 50 adds up to a total of $5.85 million.

Condition	Gross Area (Square Feet)	Cost for Preventative Maintenance	
Streets PCI > 75	3,547,115	$	3,059,386.69
Streets PCI 50-75	1,550,280	$	2,674,233.00
Alleys PCI > 75	32,900	$	28,376.25
Alleys PCI 50-75	52,500	$	90,562.50
Total Maintenance	5,182,795	$	5,852,558.44





BUS STOPS

It was determined that wherever a permanent bus stop existed the condition of the road was often in worse condition in that particular area. It is important to have more asphalt near the bus stop area (making the approximate depth of asphalt to 6-inches). Attachment A shows where the bus stops are located and where to make the asphalt layer thicker at the time of repair to prevent further road defects.

FUNDING

The City of Marysville currently has only one funding source to improve the condition of the streets and alleys of Marysville, CA. The available funding for the next five years will come from SB1, which will provide a total of $474,000 a year. Over the next five years this will add up to a total of $2.37 million, noticeably less than the calculated cost of $16.8 million required to repair the entire structural system of the City. Whether more funds will be available is yet unknown, so it is prudent to rely on the funding already available to address the current concerns prioritized by the PMS.

STREETS REPAIRED/REPAVED SINCE 2001

In the years following the 2001 Pavement Management Study, several of the street segments were repaired or repaved by various projects. In addition to the field review of the segments, this was verified through City records and by using the "Historical Imaging" on Google Earth, which has pictures taken for Google Earth in the past. The streets that appeared dark were investigated for paving or repair, and the year of repair was determined by the date when the segment went from being light to being dark. The following table shows the streets that have been repaved since the 2001 Pavement Study, the approximate year of repair, and whether it was part of the 2001 PMS Repave List. The table also shows who the project was done by - whether by the City or repaved to be a Caltrans detour for the 20 / 70 reconstruction project. There may be more street segments that had a large portion repaved by a utility or other project; these can be found where the PCI of the segment has risen since the last study. The following segments are the repaved streets that have an approximate repair date:

Repaired/Repaved Streets				
Street	**Segments**	**Year of Repair**	**Part of 2001 PMS Repave List?**	**Project**
3rd St	B St - E St	2013	No	Caltrans Detour
3rd St	E St - J St	2011	No	City Project
7th St	B St - E St	2015	No	Caltrans Detour
8th St	High St - I St	2015	No	Caltrans Detour
9th St	A St - I St	2015	No	Caltrans Detour
10th St	D St - I St	2015	No	Caltrans Detour
10th St	Blue St - Ramirez St	2011	No	City Project
12th St	B St - Hwy 20	2015	No	Caltrans Detour
14th St	B St - F St	2015	No	Caltrans Detour
16th St	Covillaud St - Sampson St	2006	Yes	City Project
17th St	Hall St - Glen St	2006	Yes	City Project
18th St	Covillaud St - Ramirez St	2006	Yes	City Project
18th St	Ramirez St - Chestnut St	2004	No	City Project
19th St	Hall St - Covillaud St	2006	Yes	City Project
B St	24th St - 3rd St	2015	No	Caltrans Detour
Buchanan St	17th St - 16th St	2006	Yes	City Project
D St	10th St - 9th St	2013	No	Caltrans Detour
E St	14th St - 10th St	2010	No	Caltrans Detour
F St	15th St - 10th St	2015	Yes	Caltrans Detour
Huston St	19th St - 22nd St	2010	Yes	City Project
I St	10th St - 8th St	2013	No	Caltrans Detour
J St	5th St - 4th St	2011	No	City Project
Rideout St	Covillaud St - Hall St	2010	Yes	City Project
Yuba St	10th St - 12th St	2015	Yes	Caltrans Detour

Sidewalk, Ramps, and Curbs

During this study it was also determined that some of the sidewalks, ramps, and curbs are in very poor condition. The sidewalks that are in need of repair are either broken, cracked, or have a higher slope than allowed by code. A ramp in need of repair can mean that it is an existing ramp that is steep, it cannot be accessed by a wheelchair, or has some other major defect. A curb in need of repair can mean that it is either really high or broken. The following streets have recordings of a sidewalk, ramp, or curb in damaged condition, although there may be more streets that are affected by this than the table indicates. These are not all of the areas needing to be addressed since many of the corners do not have accessible ramps on them.

Segment	Defect
11_G_H	Damaged Ramp
13_RAM_YUB	Damaged Sidewalk
15_SAM_SWE	Damaged Ramp
2_A_B	High Curb
5_END_B	High Curb
6_C_D	High Curb
6_D_E	High Curb
7_D_E	High Curb
7_H_I	Damaged Ramps
8_I_J	Damaged Ramps
8_I_J	High Curb
C_5_4	High Curb
D_12_11	High Ramp
D_13_12	High Ramp
D_14_13	Damaged Sidewalk
F_13_12	High Curb
G_12_11	Damaged Sidewalk
G_7_6	Damaged Ramp
H_7_6	Damaged Sidewalk WS
I_13_12	Damaged Curb (Culvert)

CONCLUSION

As mentioned previously, the City of Marysville has responsibility for approximately 10.4 million square feet of paved surface; of this total, 5.2 million square feet have a PCI greater than 50, so approximately 50 percent of the system has a PCI of less than 50. Considering the entire system, the segments with a PCI under 50 add up to 94.3% of the entire cost. The total repair cost adds up to a total of $17.4 million if only the structural section is counted, and the total project repair cost could be as high as $32.2 million for complete street segment repairs. Furthermore, the streets with a PCI greater than 50 can be addressed through preventative maintenance, which represents an additional $5.85 million in required costs.

Major Repairs					Preventative Maintenance				
Top 5 Street Segments to Reconstruct					Top 5 Street Segments to Slurry Seal				
ORDER	STREET	FROM	TO	PCI	ORDER	STREET	FROM	TO	PCI
1	22ND	GLEN	CHEIM	22	1	7TH	E	F	52
2	22ND	HALL	JEAN	8	2	C	5TH	4TH	65
3	B	1ST	2ND	15	3	H	5TH	4TH	39
4	B	2ND	3RD	16	4	6TH	C	D	59
5	17TH	RAMIREZ	CHESTNUT	20	5	ELLIS LAKE DR	14TH	ELLIS CT	57
Top 5 Alley Segments to Reconstruct					Top 5 Street Segments to Minor Repair / Slurry Seal				
ORDER	STREET	FROM	TO	PCI	ORDER	STREET	FROM	TO	PCI
1	HIGH	4TH	5TH	6	1	1ST	B	C	45
2	WILLOW	9TH	8TH	9	2	1ST	C	D	26
3	MAPLE	9TH	8TH	12	3	4TH	D	E	39
4	LEMON	5TH	4TH	9	4	G	11TH	10TH	46
5	HIGH	4TH	3RD	10	5	22ND	HUSTON	DEL PERO	38

With these high repair and maintenance costs, it is important to use the funding as effectively as possible. The total funding for the next five years is $2.37 million from SB1, which is not enough to repair the entire pavement system. The City should prioritize and organize repairs and maintenance in such a way to make the most of the funding. As discussed, the best solution is to repair the segments with a PCI under 25 first while at the same time performing ongoing maintenance. It is also important to prioritize the segments in such a way that will have the most positive impact on the users, which means that the streets should be repaired before the alleys because the streets have a higher traffic flow than the alleys. These priorities should be re-evaluated every few years since with time the surface condition of every street changes differently. If the repair program is not completed, the street condition will continue deteriorating, and the cost of repairs will go up, which is why it is vital to keep up the condition of the streets, even with a limited budget.