



ROAD MAINTENANCE AND IMPROVEMENT PLAN



October 3, 2018

TABLE OF CONTENTS

Page 2.....INTRODUCTION

Page 3.....GUIDING PRINCIPLES

Page 3.....ASSET MANAGEMENT

Page 3.....ROAD CLASSIFICATION

Page 4.....ROAD MAINTENANCE

Page 4.....GRAVEL ROADS

Page 5.....HARD SURFACE

Page 6.....ROAD IMPROVEMENT

Page 7.....CONCLUSION

Page 8.....SIGNATURE PAGE

APPENDIX 1.....HARD SURFACE TO BE MAINTAINED

APPENDIX 2.....HARD SURFACE TO BE ADDED

APPENDIX 3.....GRAVEL ROADS TO BE IMPROVED

APPENDIX 4.....DUST SUPPRESANT TO BE ADDED

INTRODUCTION

MISSION: To provide and maintain professional administrative, technical and operational support to the essential infrastructure as well as to Park County Citizens. In addition to provide the highest possible level of service and safety, while managing efficient use of county resources.

OPERATIONAL PHILOSOPHY: Park County Public Works Department believes that a transportation system should move both people and commodities as safely and efficiently as possible. Through continual improvement including providing education and training to our employees as well as continued efforts to both hire and retain a high quality staff.

OBJECTIVES:

The following objective are used to both guide and establish our priorities in managing our operational philosophy and accomplishing our mission.

- **Safety:** Safety is our number one priority for both our employees as well as the public
- **Public Focus:** The Public Works Department wants the citizens to know that we care about their needs and we are dedicated to providing outstanding customer service.
- **Efficiency:** The Public Works Department will strive to provide a safe and efficient transportation network in the most cost effective and efficient manner possible
- **Accountability:** The resources we have been given will be used in the most efficient manner possible with an emphasis on minimizing waste.
- **Problem Solving:** The Public Works Department will strive to use innovative and efficient solutions to solving problems.

- **Sustainability:** We will strive to maintain budgets and provide the most economic solutions possible to make the most of the resources that have been entrusted to us. With both the equipment replacement plan as well as the road maintenance improvement plans sustainability is the primary objective to ensure continued feasibility well into the future.
- **Work Force:** The Public Works Department will strive to hire and retain the most qualified staff as possible. In addition we will strive to provide the highest level of training and continuing education as possible.

GUIDING PRINCIPALS:

- Provide a high quality of customer service by letting the citizens know that we do care and will respond to their concerns in an efficient manner, in order to provide a high quality infrastructure.
- Ensure that the infrastructure is maintained and constructed in a manner that will provide for a safe and sustainable transportation system.
- Plan for the future to provide continued and sustainable infrastructure.

Asset Management

The county roads comprise the largest portion of the investment in infrastructure. Therefore the principals of asset management will be utilized to both maintain and improve the county road system. The asset management will (1) improve roadway management efficiency and capability (2) support the shift from new construction to maintenance (3) work with budget constraints by providing a rational approach and justification for the investment in improved infrastructure (4) increase the public perception and accountability (5) make rational decisions as the population increases and the demand on the road system increases (6) work with the continual constraints of budget, personnel retention, personnel training and the condition of equipment that is available for road maintenance (7) to improve the communication with both citizens as well as the elected officials.

ROAD CLASSIFICATION

The roads within the county are typically classified into 5 major categories: Principal arterial, Minor arterial, Collector roads, local roads and non-maintained roads. These classifications are discussed below

Principal Arterial: These roads provide major traffic movement within the County such as from business districts to outlying areas, or between major residential areas and rural areas. These roads provide continuity for all rural roads and typically have the highest traffic volumes.

Minor Arterial: These roads typically have a lower trip length and lower traffic volumes than the Principal Arterials. In addition these roads provide access to smaller areas than the Principal Arterials. They connect to the collector roads to facilitate the movement of vehicles from subdivisions and business areas.

Collector Road: These roads collect traffic from local subdivision areas and channel it to the Arterial roads. These roads provide access within and between local subdivision neighborhoods. They provide a linkage between small communities.

Non-Maintained Roads: These include roads that are platted and filled with the county but were not constructed to County Standards and therefore were not accepted for maintenance. Until such time as these roads are upgraded the County will only provide emergency access and maintenance.

ROAD MAINTENANCE

The purpose of the road maintenance and improvement plan is to continually evaluate the changing condition of the County Roads and adjust as necessary to accommodate the changing conditions. In the course of evaluation and re-evaluation tradeoffs will be made to maximize the available resources in order to effectively maintain and improve County Roads. Of high importance is preventative maintenance of the existing roads, both gravel and hard surfaced. In order to effectively orchestrate the plan effective preventative maintenance must be carried out to extend the life of the existing roads, as well as explore all possible options and new technology that will assist with overall cost savings. In addition a continual effort will be made to explore potential funding sources to assist with the implementation of the plan. The overall safety of the County roads is paramount and measures will need to be taken to correct unsafe conditions on all county roads. As the road maintenance and improvement plan is implemented it is the goal to continually move roads from those that receive only routine preventative maintenance to becoming improved roads. In doing this the average daily trips (ADT) of the roads will be a major consideration. Typically the higher the traffic volume roads will be improved first as well as roads that have significant safety concerns. The following is an outline of the routine preventative maintenance to be carried out on County Roads. There are two major components the first is the maintenance plan and the second is the Improvement plan.

MAINTENANCE PLAN

The maintenance plan is designed to provide routine and preventative maintenance to the County Road System. The routine maintenance is divided into the maintenance of gravel roads and the maintenance of hard surfaced roads. Both of these are further divided into summer and winter protocols. These are discussed below:

GRAVEL ROADS

Summer Months (Typically April through October)

- **Routine Grading** will include Grading, crowning, maintaining proper width, super elevation, alignment and Ditching.
- **Dust Suppressant** to be applied to improved gravel roads or where needed.
- **Drainage Maintenance** will include the best management practices to continually upgrade existing structures and the possible placement of additional structures.

- **Vegetation maintenance** will include weed control as well as mowing and trimming of trees within the right of way.
- **Signage** will include the installation and repair of signs
- **Surface** will include the addition of surface materials such as road base
- **General Repair** will include the addition or repair of existing guardrail, repair of failing road sections, repair to bridges and existing structures.

Winter Months (Typically October through April)

- **Plowing** will include the removal of snow and ice and as necessary sanding and cutting ice/snow pack
- **Drainage** will include steaming culverts and controlling ice flow in ditches as well as the road surface.
- **Signage** will include the repair and installation of signs as necessary
- **General Grading** will include routine grading and ditching with the addition of surface materials as the weather allows.

HARD SURFACED ROADS

Summer Months (Typically April through October)

- **Overlay** will include the placement of chip seal or HMA (hot mixed asphalt) overlays to extend the design life of the existing hard surface. In addition, the implementation of alternatives such as cold in place recycling, heater remix of asphalt surfaces and full reconstruction of severely damage areas or placement of recycled asphalt.
- **Shouldering** will include the maintenance of shoulders to prevent edge cracking as well as ditching operations to prevent water intrusion into the road surface.
- **Patching** will include the placement of hot mix asphalt patches as well as the use of cold mix and recycle asphalt materials to patch pot holes and repair damaged areas.
- **Crack sealing** will include the placement of crack seal materials to prevent moisture intrusion into the pavement
- **Signage** will include the repair and placement of signs as necessary
- **Drainage** will include the cleaning and maintenance of culvers and ditches
- **Vegetation Management** will include weed control, mowing and tree trimming within the right of way

- **General Repair** will include placement and repair of guardrails, culverts, and bridges

Winter Months (Typically October through April)

- **Plowing** will include the removal of snow and ice from the road surface as well as sanding
- **Crack Sealing** will include the sealing of cracks to prevent moisture intrusion into the surface as the weather allows
- **Patching** will include the use of cold mix asphalt or recycle asphalt to repair pot holes or damage areas as the weather allows.
- **Drainage** will include the steaming of culvers as well as maintaining ditches
- **Signage** will include the repair and installation of signs as necessary
- **General Repair** will include the placement and repair or guard rail, bridge and culvert structures.

ROAD IMPROVEMENT

The road maintenance and improvement plan will be the guide for maintaining the road system in Park County. The overall plan is composed of four distinct plans as follows:

(1) The Hard Surface Maintenance/Improvement Plan:

This plan is to maintain the existing hard surface in Park County. The roads were evaluated using the Paser method of evaluation, which provides a rating system for both chip seal and asphalt pavements. The roads were divided into segments, depending upon the length. Each segment was then evaluated and rated on a scale of 1 to 10, 1 being the most sever requiring immediate maintenance and an 10 being a new surface. In addition to the evaluation the ADT was used to rate these roads. Overall demographics were also taken into account in determining the basic plan for hard surface maintenance. This plan will be re-evaluated each year and modified as necessary for changing road conditions.

Hard Surface to be Added Plan:

This plan provides for the addition of hard surfaced roads in the County. Many of the roads to be hard surfaced are major and minor collector roads that are currently receiving dust suppressant. The majority of the hard surface that will be placed will be chip seal. Depending upon the performance of the surface an overlay will be added as necessary. As gravel roads become hard surfaced the ultimate results will be less miles to be graded each year. In addition, during snow removal there will also be less grader miles, with roads being cleared more efficiently with plow trucks.

(2) Gravel Roads to Be Improved:

This plan will encompass gravel roads that are currently not being treated with dust suppressant. Although, ADT results as well as road classification will be utilized in determining which roads will be improved, the existing condition as well as the materials that are currently on the road will play a major part in determining the order in which the roads will be addressed. The goal will be to provide a gravel surface that will be conducive to routine maintenance, by providing a material that can be effectively graded and shaped to provide drainage and help to resist pot holes and washboards. Although, both pot holes and washboards are inevitable, the goal will be to have a road surface that will last longer between each grading and thus allow the graders to provide routine maintenance to other less traveled roads. In addition another major goal will be to prepare these graveled roads for future dust suppressant applications.

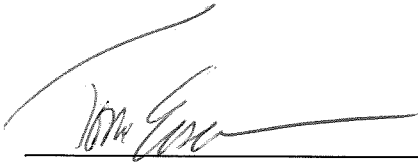
(3) Dust Suppressant to be added:

This plan will follow in line with the gravel roads to be improved. As existing gravel roads are improved they will be more conducive to the addition of dust suppressant. Also, as roads that are currently being treated with dust suppressant are being covered with hard surface, new roads will be added to the list that receive the dust suppressant. The end result will be a more efficient and safe road system for Park County.

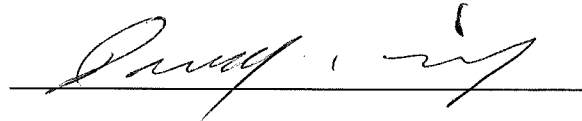
CONCLUSION

Based upon this four plan approach as time and funding become available the road system for Park County will steadily improve. This plan will be re-evaluated each year and change as necessary to provide as efficient a road system as possible with the available resources. The updated road maintenance and improvement plan as well as the yearly project plan will then be submitted to the County Manager for review and recommendation to the Board of County Commissioner for Approval. The yearly project plan will first look at the overall plan in determining the road projects to be completed each year. The yearly project plans may also change due to unforeseen events, such as fires and flooding which may alter the project priority in any given year.

Date: October 11, 2018



Tom Eisenman, County Manager



Darrell Evig, Public Works Director



Mike Brazell, Board of County Commissioner



Dick Elsner, Board of County Commissioner



Mark Dowaliby, Board of County Commissioner

APPENDIX 1

REPAIR OF EXISTING HARD SURFACE ROADS

Park County has approximately 314 lane miles of hard surface roads. These roads represent a significant investment in time and materials. Additionally these roads have been constructed over many years and are in varying conditions. The roads were currently evaluated using the PASAR system, which rates the roads on a scale of 1 to 10, with 10 being new condition and a 1 being near failing. Current traffic counts have also been taken on the majority of these roads as well. The attached hard surface maintenance and improvement plan was developed using both the ADT (average daily traffic) as well as the rating provided by the PASAR system as a guide to schedule the maintenance and or upgrade to the existing hard surface roads. As can be seen from the attached list, providing both chip seal overlays and asphalt overlays is expensive. For any given road the most effective approach is to overlay the entire road or overlay the longest section possible in a single year. Some of the roads that have been paved with HMA (hot mix asphalt) have sections that need complete replacement. Due to the high cost of HMA, alternatives such as using recycle asphalt for the bottom lifts with only a 2 inch top overlay of HMA would provide a substantial cost savings over placing HMA to full depth. In addition, other alternatives are being looked at such as cold in-place recycling, or heater re-mix methods to recondition the asphalt. Chip seal overlays would also be utilized. The ultimate goal for the hard surfaced roads would be to achieve a 10 year design life. Once a road has been overlaid, with either chip seal or HMA it will need effective routine maintenance including ditch and shoulder, crack sealing and pot hole repair to help the surface achieve the design life.

The attached plan will be reviewed at a minimum of once per year and will be amended as necessary due to changing road conditions, traffic loadings and budget constraints. In addition we will continually look at new and innovative techniques to lower costs, while still providing high quality hard surfaced roads for the County.

APPENDIX 2

HARD SURFACE TO BE ADDED

Providing that additional funding becomes available to add additional hard surface roads to the road network. The following list and tentative schedule will provide a basic plan for converting the gravel roads to hard surface. It should be noted that the current emphasis will be to maintain the existing hard surface road ways (see hard surface maintenance plan). The hard surface maintenance plan follows the current budget constraints until the year 2022 at which time additional funding would be necessary in order to follow the hard surface maintenance plan as well as to begin to follow this additional hard surface plan.

Converting some of the higher traffic gravel roads to hard surface will have several advantages in both long term cost savings as well as reducing grader miles. The reduction in grader miles on the high traffic roads will allow for more routine maintenance to be performed on local and subdivision roads. Several of the gravel roads that are shown below are currently stabilized with dust suppressant (mag-chloride). Although the mag-chloride option is initially cheaper than hard surface it is very close over time when the amount of labor that is required to maintain the mag-chloride is included in the calculations. In addition as roads that are currently mag-chloride treated are converted to hard surface additional lower volume local roads could be treated with the mag-chloride. This would ultimately allow for more maintenance in subdivision roads and increase the overall quality of the county road network. The following list will be evaluated annually and will be revised as local demographics as well as personnel/equipment availability as well as funding change. The additional chip sealing could be made more or less aggressive in the future.

YEAR	ROAD NAME	LENGTH	**COST FOR CHIP SEAL BASED UPON 2 LIFTS OF ¾ (will vary due to market conditions)
2022	CR 32	4.3	\$190,662
2023	CR 15 NORTH	9.5	\$421,230
2024	ARROWHEAD	2.85	\$126,369
2025	CR 4	1.9	\$84,246
2025	CR 94	1.7	\$75,378
2026	CHIEF/STAGE STOP	5.3	\$235,002

YEAR	ROAD NAME	LENGTH	COST FOR CHIP SEAL BASED UPON 2 LIFTS OF ¾ (will vary due to market conditions)
2027	UPPER 4/NUT HATCH	1.9	\$96,882
2027	CR14	2.8	\$142,775
2028	CR15 Murphy to Wildwood	5.4	\$ 275,352
2028	CR32 Additional lift	4.3	\$125,504
2029	CR 15 south	5.2	\$265,153
2029	CR 15 North 1 lift	9.5	\$277,277
2030	CR 6	3.16	\$161,132
2030	ARROWHEAD 1 lift	2.85	\$83,183
2031	CR 98		
2031	CHIEF/STAGE STOP	5.3	\$154,691
2032	VIGILANTY	1.75	\$89,235
2032	MOCKINGBIRD	1.98	\$100,963
2033	WEELS FARGO	2.59	\$132.067
2033	Campfire		
2034	Platt River Drive	1.63	
2034	CR 98		
2035	CR 5	5.8	

** - Will vary do to market conditions

APPENDIX 3

GRAVEL ROADS TO BE IMPROVED

This plan lists roads that will be improved, by making drainage improvements as well as re-conditioning the existing surface, by use of the Reclaimer, and rock crusher to grind/crush and mix the existing materials that are present on the roads to provide a surface that provides for safer travel, less potential damage to vehicles and will make routine grading more effective. The use of the crusher and Reclaimer will assist in minimizing the amount of new surface that would need to be hauled to the roads. Depending upon the condition of the roads after the mixing and crushing operations varying amounts of clay and imported gravel would be added as needed.

This is typically the most economical phase of improvement as unlike dust suppressant and hard surface this work is typically accomplished in-house, with only personnel and machine time required for the completion. In addition the work can be completed around other projects with a portion of the work completed in winter months, early spring and late fall after dust suppressant and hard surface projects have been completed.

YEAR	ROAD NAME	LENGTH (Total Miles)	IMPROVEMENT TYPE
2019	CR 60	6	Crusher/Reclaimer/shape/re-compact
2019	CR1	2 (remaining from 2018)	Crusher/Reclaimer/shape/re-compact
2019	CR 61	1.98	/Reclaimer/shape/re-compact
2019	CR 98		Reclaimer/shape/re-compact
2020	CAMPFIRE	5.3	Reclaimer only
2020	RANCH ROAD	8.09	Reclaimer only
2020	WINDMILL	2.55	Reclaimer only
2020	Platte River Drive	1.63	Crusher/Reclaimer/shape/re-compact
2021	Pine Cone	.34	
2021	Zebulon St	1.45	Crusher/Reclaimer/shape/re-compact
2021	Valley of the Sun	2.56	Crusher/Reclaimer/shape/re-compact
2021	Bush Run	2.45	Crusher/Reclaimer/shape/re-compact
2022	CR 53	8	Crusher/Reclaimer/shape/re-compact

YEAR	ROAD NAME	LENGTH (Total Miles)	IMPROVEMENT TYPE
2022	Campfire	5.3	Reclaimer only
2023	CR 53	8	
2023	Black Buck Trail	1.59	
	CR 14A	1.2	Crusher/Reclaimer/shape/re-compact
2024	Quartzville	2.82	Crusher/Reclaimer/shape/re-compact
2024	Coil	1.7	Reclaimer only
2025	CR 18	6	Crusher/Reclaimer/shape/re-compact
2025	High Chaparral	4.46	Reclaimer only
2026	CR 12	4.55	Crusher/Reclaimer/shape/re-compact
2026	Mountain View	1.82	Crusher/Reclaimer/shape/re-compact
2026	Roberts Road	2.43	Crusher/Reclaimer/shape/re-compact
2027	Vigilante	1.0	Reclaimer only
	Wells Fargo	2.59	Reclaimer only
	High Meadow	1.59	Reclaimer only
2027	CR 23	10	Reclaimer only
2028	Venture	1.98	Crusher only
2028	Lake View	.95	
2028	Kokanee	.51	
2028	Trout	2.01	
2029	CR 22	7.28	Reclaimer only
2029	CR 58	1.78	Crusher only
2030	Mocking Bird	1.97	
2030	Del Wood Drive	1.51	
2031	CR 31	7.21	Reclaimer only
2031	CR 411	3.9	Reclaimer only
2032	Badger Creek		
2032	Aspen Trail	1.89	
2033	MC Murry Rd	6.5	
2034	CR 90	4.89	

YEAR	ROAD NAME	LENGTH (Total Miles)	IMPROVEMENT TYPE
2035	CR 211	2.5	
2035	CR 112	2.3	

APPENDIX 4

DUST SUPPRESSANT TO BE ADDED

As roads which were previously treated with dust suppressant are converted to chip seal additional roads will become available to receive dust suppressant. The overall goal will be to cover the highest traffic volume roads with chip seal and reserve the dust suppressant for the lower volume local roads. In addition as existing gravel roads are improved by using in-house resources such as crushing/reclaiming or the addition of gravel and clay these roads will be ready to receive dust suppressant. By increasing the total miles of county roads that have hard surface and subsequently increasing the total miles or county roads to be treated with dust suppressant the total grader miles will be reduced. This will ultimately result in graders spending more time in local subdivision roads. This plan will be reviewed annually and will be amended as necessary depending on changing demographics, funding and available personnel. It should be noted that as roads that are currently being treated with dust suppressant are hard surfaced they will be dropped from the yearly list of stabilized roads to receive dust suppressant, while the new roads to receive dust suppressant will then be added to this list.

YEAR	ROAD NAME	LENGTH	COST @ 0.6 gallon/SY (will vary due to market conditions)
2020	CR 98	11.5	\$78,694
		TOTAL	\$78,694
2021	Ranch Road	8.09	\$55,359
		TOTAL	\$55,359
2022	Camp Fire	5.3	\$36,268
2022	Windmill	2.55	\$17,450
		TOTAL	\$53,718
2023	Platte River Drive	1.63	\$11,154
2023	Pine Cone	.34	\$86,170
2023	Valley of the Sun	2.56	\$17,518
		TOTAL	\$114,842
2024	CR 1	2.3	\$15,739
2024	Zebulon	1.45	\$9,923
2024	Bush Run	2.45	\$16,765
		TOTAL	\$42,427
2025	Quartzville	2.82	\$22,156
2025	High Chaparral	4.46	\$35,041
		TOTAL	\$57,197

YEAR	ROAD NAME	LENGTH	COST @ 0.6 gallon/SY (will vary due to market conditions)
2026	CR 12	4.55	\$35,748
2026	Mountain View	1.82	\$14,299
		TOTAL	\$50,047
2027	Vigilantly	1.0	\$7,857
2027	Wells Fargo	2.59	\$20,349
2027	High Meadow	1.59	\$12,492
		TOTAL	\$40,698
2028	Roberts	2.43	\$19,092
2028	Venture	1.98	\$15,557
		TOTAL	\$34,649
2029	Lake View	.95	\$7,464
2029	Kokanee	.51	\$4,007
2029	Trout	2.01	\$15,792
		TOTAL	\$27,263
2030	CR 22	7.28	\$57,197
		TOTAL	\$57,197
2031	Mocking Bird	1.97	\$15,478
2031	Delwood Drive	1.51	\$11,864
		TOTAL	\$27,342
2032	CR 31	7.21	\$56,647
		TOTAL	\$56,647
3033	Badger Creek	3.05	\$23,963
2033	Aspen Trail	1.89	\$14,849
		TOTAL	\$38,812
2034	CR 90 (HWY 24 to CR 90)	4.89	\$38,419
		TOTAL	\$38,419
2035	CR 100	1.6	\$12,570
2035	CR 71	7.78	\$61,125
		TOTAL	\$73,695