



Benton County Public Works Gravel Road Maintenance and Surfacing Priority Policy Revised October 26, 2015

The following are policy guidelines prepared for the Roads Advisory Committee by Public Works management. This policy is designed to provide the public with information on Road Department priorities, techniques and material requirements for maintaining the County's gravel roads. This policy provides a rating system for the prioritization of improving and upgrading gravel roads to either oil mat or paved surface as traffic needs change and/or increase. The original policy was created in 1996 and is recommended to be updated every five years.

Gravel Road Maintenance Strategy

General Principles

- Benton County is divided into five gravel road maintenance areas.
- Each maintenance area will stand alone in prioritizing gravel roads for asphalt.
- Resources are allocated such that some level of maintenance is provided for all classes of gravel roads.
- Both preventative (pothole patching, grading) and corrective (adding rock, mowing and brush removal, etc) maintenance work is provided on an annual basis.
- A minimum of one road in each of the five maintenance areas will be prepared for hard surfacing according to that area's priority list.
- Paving Assistance Program—In order to advance road improvements on those roads where homeowners choose to actively pursue the betterment of their roads, the County works in cooperation with citizens, providing labor and equipment, and citizens provide materials for their particular project.

Gravel Road Maintenance

Scope

The Public Works Department maintains 180 miles of gravel roads throughout Benton County. These roadways range from rural collectors travelled by several hundred vehicles per day to local roads that carry less than 20 vehicles per day. Due to the nature of gravel roads, periodic routine maintenance is performed to maintain a safe travel surface.

Gravel Road Safety Issues

Geometrics

- Road alignment—the flow of the driving path
- Sight distance

- Curves—roads with enough directional change to merit decreased speed
- Surface
- Loose aggregate
- Potholes
- Ruts
- Erosion
- Visibility
- Dust
- Lack of defined road edge
- Vegetation
- Signage

Materials

Quarry rock is used on all Benton County gravel roads. During the rainy season, additional 1” open-graded rock is applied to roads where needed to increase support and minimize vehicle slippage due to mud. On hills and during the drier season, ¾”- rock is used to tighten the travel surface and prevent wash boarding.

Equipment

Public Works has two graders capable of grading a 12-foot wide pass. Five 10-yd dump trucks, one 66” steel roller and one 3000 gal water truck are also utilized to support grading.

Personnel

The County gravel road budget dedicates 2,220 man hours to grading, rocking & dust control. These hours are divided between the three programs as needed. In general, two grader operators grade roads over 3 months during a 6-month time frame, as weather and road conditions allow. Likewise, two trucks deliver and spread rock for approximately 2 months, over a six month period, depending on weather and road conditions.

Frequency

Grading--Every gravel road in Benton County will be graded 2 to 5 times each year. The frequency of grading a particular road is determined by weather and traffic usage in each given year. Special consideration is given to one-time occurrences, such as unusual logging on a road, or other extenuating circumstances.

Rocking—Benton County budgets 12,000 tons of rock for surface rock replacement each year. For general rocking of distances, 475 tons are required to rock a one-mile long section of road 1” deep, 22 ft wide. The County also uses a technique called spot rocking to replace gravel on roads that have lost their aggregate surface due to deterioration from vehicle traffic and weather. Open-graded rock is mixed into the weak areas for increased support and integrity.

Prioritization of Maintenance

The County is divided into two sections for grading, south and north. The southern section encompasses the southern half of Area 1, beginning with Airport Road, Area 3 (Monroe), and Area 5 (Alesa). The northern section includes Areas 2 (Camp Adair) and 4 (Kings Valley), as well as Area 1 north of Airport Rd. Graders work each area, based on the efficient order of servicing all roads. Roads in good condition may be skipped in favor of servicing roads in greater need. After this initial pass, graders will repeat service on each road on an as-needed basis.

Dust Control

The County facilitates the application of dust control products to gravel roads. It serves as the fiscal agent, collecting and coordinating payment and providing advertising, as well as scheduling the contractor. The County will provide contractors with a list of acceptable products to be used for dust control on County roads.

Vegetation Control

Shoulder Spray—Specifically targeting grasses, Benton County provides no spring shoulder spray program for gravel roads. For maximum effect and minimum environmental impact, road shoulders will only be sprayed in late fall.

Broad leaf—The broad leaf program specifically targets woody plants, including wild berries. Both Spring and Fall programs are budgeted yearly.

Mowing--The County is divided into 5 maintenance areas for mowing. Each maintenance area is scheduled according to the following policy:

Spring—Mowers will make only one four-foot wide pass on gravel roads;

Summer—Only performed as needed for particular projects;

Fall—Full pass mowing. The width of the pass may vary from 4 to 12 feet, as needed;

Winter—Full pass mowing.



Services Not Provided

Public Roadways not meeting County Standards

Certain public roads have been built as part of private neighborhood developments and do not meet Benton County standards. These roads are not maintained by Benton County. Responsibility for maintenance of these roads lies with the public that resides on these roadways. Benton County Public Works will contract with these Road Districts and Road Associations upon request. Each association must provide one contact person who is authorized to contract any road work to be done. This person will be responsible for ensuring timely payment of any services contracted.

Private Roadways

Driveways, private roadways & private parking lots do not fall under the jurisdiction of Benton County Public Works and no routine maintenance will be performed on them.

Maintaining Gravel Roads During The Rainy Season

Benton County gravel roads are routinely graded during traditionally rainy months to minimize ruts, washboarding and potholes. A 5-pass grading technique is utilized: Three passes cut the surface, breaking up existing gravel to attain better bonding, and two are for spreading additional gravel. Graded roads will be shaped with a 4% crown down the center to aid in shedding water.

Grading will occur only on dry or lightly rainy days. These weather windows provide optimum conditions for successful grading. On a given day, 4 to 6 miles can be effectively graded.

During the months of December thru February an open graded rock (one that contains little or no fines) will be used to strengthen the road surface and aide in solidifying the road surface. After February only light rock with fines will be used to aide in solidifying the road surface. In combination with reduced grading this will serve to tighten up roads for summer months.

Maintaining Gravel Roads During The Dry Season

Grading--Starting in June, grading gravel roads will only be provided as needed. With dry weather, typical grading results in loose compaction and road deterioration. Tight blading is used during dry months to remove loose rock from roadways and form a berm of rock on the shoulders.

Dust Control—Benton County does not include dust control application in our regular budgeted road maintenance. The County does oversee a publicly funded program to control dust on gravel road surfaces coordinating residents with a private contractor. Benton County will:

- notify the public of application procedures, instructions and costs;
- provide roadway preparation;
- provide payment collection from citizens desiring dust control product application;
- schedule and coordinate with private subcontractors to effectively provide dust control management.
- Dust control product applied at a rate of .5 gallon/square yard 60% lignin to water dilution.

Mechanically sprayed dust control application begins June 1. In years of low seasonal rainfall, the County may order product application provided in two separate half shots, in order to attain better long term effects.

Maintaining Gravel Roads When It Snows

Gravel roads are included in the snow removal and ice control operations policy. Roads will be cleared and maintained based on their service level as described in the snow and ice policy. Gravel roads will be cleared only with graders unless emergency vehicle access requires higher priority.

Parking on Gravel Roads

Parking on gravel roads will be prohibited on roads of inadequate width. Some roads allow limited roadside parking if shoulder and roadway widths are sufficient to allow safe, and unrestricted traffic movement. Emergency parking is allowed only with appropriate warning devices (flares, signs).

Speed on Gravel Roads

According to Oregon Law, the Oregon Department of Transportation is responsible for establishing speed zones on all highways in Oregon. All gravel roads are subject to the Basic Speed Rule, which states that a motorist must drive at a speed that is reasonable and prudent at all times, considering other traffic, road and weather conditions, dangers at intersections and any other conditions that affect safety and speed. In other words, drivers are expected to use good judgment in selecting their speed.



Gravel Road Surfacing Policy

Gravel roads surfacing needs are rated, based on the following formula:

$$\frac{\text{Average Daily Traffic} \times \text{Number of Residences within 200 Feet} \times 10,000 \text{ (rounded off)}}{\text{Cost}}$$

Factors:

- A. Average Daily Traffic—Traffic is measured at the point of connection with the next higher or equal functional class road (i.e., intersection);
- B. Number of residences within 200 feet—200 feet is used to define the area next to a gravel road where dust from vehicle traffic is most likely to generate public complaint. A minimum of one household is required. Dust control is a determining factor because it is traditionally the primary concern and the highest public awareness factor;
- C. X 10,000—Arbitrary number used to round the calculated rating point off to the nearest positive integer;
- D. Cost—Total cost to the County for completing the desired project;
- E. Qualifying Project—a project shall be determined by Benton County Public Works staff based on zoning, build-out potential, community needs, and available funds. All projects shall have a beginning point abutting an existing County, State, or City hard-surface road having an equal or higher quality surface than the proposed project.

This simplified formula was created after discussion led the County and RAC to agree that other factors such as length, residence/mile, geometry, condition as a substandard road, and amount of truck traffic all affect the above 3 basic factors (A,B,C).

1. **Allocation of available funds**—Based on the formula above, the County will develop a calculated order of recommendations for roads in each maintenance area for hard surfacing. As funds become available the road improvements will be performed in the area that is in accordance with the Surface Treatment Rotation schedule. Per 1996 RAC recommendations, exceptions may be made in instances where it is more cost effective to perform a road project out of order. The public will be kept informed by display of the priority list. Public participation in fund raising efforts may be used in order to lower County costs, resulting in a higher priority rating for the identified road.

Hard Surface Rotation Cycle

Area 1	Area 2	Area 3	Area 4	Area 5
2014	2015	2016	2017	2013
2018	2019	2020		
2021	2022	2023	2024	2024
2025	2026	2027		
2028	2029	2030	2031	2031

2. **Public roads improvement policy**—It is the policy of County management to pursue the improvement of all County roads to the minimum of oil mat road standard as funds allow. While the initial cost is significant, the lower maintenance cost and higher quality road that results is considered money well spent.
3. **Hard surfacing criteria**—The County management team will maintain these 5 priority lists and update them as road data changes and/or becomes available. Staff will determine which hard surface treatment will be used, oil mat or asphalt. RAC will review these lists and discuss progress on an annual basis. Occasionally road grindings become available for County use to strengthen the base on gravel roads before hard surfacing. These often come from other jurisdictions and, due to economic considerations, are limited as to where they will be stored/used. This location may change the rotation of a given road in order to best utilize county funds.

Hard surfacing priority criteria—A rating system has been established to prioritize all County gravel road projects. The RAC subcommittee created a formula as follows:

$$ADT * N_{200} * 10000 / \$Total$$

ADT = Average Daily Traffic—used as an indicator of road usage

Units: vehicles per day

Minimum value is 1

Data is not available for all roads

N_{200} = number of residents within 200 feet of the road

200 feet is the arbitrary distance from the roadway wherein dust is an issue for residents.

10,000 = This factor simplifies the appearance of the priority point data by shifting the decimal point.

$\$Total$ = total dollar cost

Objective comparisons of the different roads can benefit from looking at the cost per mile rather than the total cost of the project, providing some insight into the return for each dollar spent. Typically the total cost is the ultimate issue. Project costs are large compared to the County's

budget. The value of selecting very dollar-efficient projects can be offset by the value of getting more than one project done in a year.

This simplified formula was created after discussion and exchange of ideas at RAC meetings. The formulation accounts for many factors that must be considered by the County. It is also straightforward—easy to justify and explain to the public.

Property Owner Support- Working off the surfacing priority list, before a gravel road is considered for paving, 60% of property owners on a given road must support the project. If 60% don't agree with the project, the next road on the list will move up in priority.

Allocation of available funds—As funds become available, the roads will be improved in order based on priority points as described above (see Gravel Road Surfacing Policy, Section 1. Allocation of available funds, page 5.) The RAC subcommittee recognizes that circumstances may warrant pursuing a project out of order. In general, the priority lists should be respected.

Public participation in funding a project can significantly change its priority score. This venue for cooperation with citizens could prove very cost effective for the County (and the residents along the road). This requires groups of residents to use the Paving Assistance Program (PAP).

AREA 1						
SCORE*	COST	ROAD NUMBER	ROAD NAME	GRAVEL	ADT	RES
0.18	\$ 54,756	14341	Burris	0.54	-	-
0.25	\$ 39,546	25642	Hoagland	0.39	-	-
0.30	\$ 33,462	14340	Garden	0.33	-	-
1.45	\$ 34,476	35101	Hull Pl	0.34	5	1
1.64	\$ 6,084	26252	Powder House	0.06	-	-
3.29	\$ 3,042	14332	Rondo	0.03	-	-
4.33	\$ 323,466	26460	Old Peak	3.19	70	2
4.41	\$ 793,962	26440	Woods Creek	7.83	70	5
5.48	\$ 18,252	36231	Saxton	0.18	10	1
6.21	\$ 180,492	25271	53rd	1.78	112	-

*Based on formula $ADT * N_{200} * 10,000 / \$Total$

8.71	\$ 60,840	35243	Buchanan	0.60	53	-
9.28	\$ 172,380	36242	Neuman	1.70	80	2
12.10	\$ 89,232	26406	Henkle	0.88	27	4
75.30	\$ 205,842	26290	Evergreen (checked by JMW 9-22-15)	2.03	155	10
24.89	\$ 85,176	25260	Llewellyn	0.84	53	4
28.89	\$ 128,778	36232	Henderson	1.27	62	6
30.94	\$ 273,780	35300	Starr Creek	2.70	121	7
34.01	\$ 264,654	26241	Ervin	2.61	60	15
37.91	\$ 64,896	15037	Sulphur Springs	0.64	82	3
38.04	\$ 35,490	26281	Sexton	0.35	135	-
49.60	\$ 171,366	36230	Beaver Creek	1.69	170	5
132.44	\$ 273,780	25280	Airport	2.70	259	14
146.70	\$ 81,120	25300	Kiger Island	0.80	85	14
146.92	\$ 39,546	26280	Greasy Creek	0.39	83	7
147.34	\$ 135,876	25301	Powells	1.34	143	14
151.45	\$ 42,588	26251	Wonderly	0.42	215	3
181.67	\$ 57,798	25133	Herbert	0.57	175	6
201.35	\$ 36,504	26291	Aurora	0.36	147	5
207.10	\$ 4,056	26261	Ritchie	0.04	42	2
232.83	\$ 171,366	36023	Peterson	1.69	266	15
354.50	\$ 75,036	26407	Gellatly	0.74	133	20

AREA 2						
SCORE	COST	ROAD NUMBER	ROAD NAME	GRAVEL	ADT	RES
0.06	\$ 160,212	05450	Soap Creek	1.58	-	-
0.16	\$ 62,868	15617	Camellia	0.62	-	-
0.21	\$ 47,658	14042	Kouns	0.47	-	-
1.10	\$ 9,126	04610	Wishram	0.09	-	-
3.29	\$ 3,042	04620	Ridgecrest	0.03	-	-
3.45	\$ 179,478	05451	Rifle Range	1.77	31	2
4.73	\$ 146,016	04394	Robison	1.44	69	-
10.07	\$ 430,950	04650	Tampico	4.25	217	2

AREA 3						
SCORE	COST	ROAD NUMBER	ROAD NAME	GRAVEL	ADT	RES
0.07	\$ 139,932	55701	Dodge Island	1.38	-	-
0.12	\$ 86,190	03091	Oliver Creek	0.85	-	-
0.21	\$ 47,658	35026	Dorr	0.47	-	-
0.25	\$ 40,560	45012	Goracke	0.40	-	-
0.27	\$ 37,518	35023	Horning	0.37	-	-
0.35	\$ 28,392	45066	Ash	0.28	-	-
0.76	\$ 13,182	46010	Glenbrook	0.13	-	-
1.23	\$ 32,448	46121	Cemetery	0.32	-	4
2.26	\$ 221,052	56100	Hewett	2.18	50	1
2.62	\$ 194,688	35022	Eureka	1.92	51	-
4.81	\$ 249,444	45060	Cherry Creek (A)	2.46	60	2
5.11	\$ 86,190	44140	Rickard	0.85	44	1
5.97	\$ 164,268	45007	Bundy	1.62	49	2
9.80	\$ 153,114	35132	Finley	1.51	150	1
10.02	\$ 324,480	36930	Hells Canyon	3.20	65	5
12.75	\$ 41,574	45903	Losen	0.41	53	-
15.96	\$ 218,010	36900	Bunker Hill	2.15	87	4
16.53	\$ 112,554	45005	Irish Bend	1.11	93	2
19.72	\$ 87,204	46200	Green Peak	0.86	43	4
20.66	\$ 63,882	45501	Occidental	0.63	66	2
21.17	\$ 41,574	45141	E Ingram Island	0.41	22	4
22.62	\$ 152,100	35024	Hulburt	1.50	172	2

24.76	\$ 476,580	35220	Bruce	4.70	118	10
25.53	\$ 285,948	56060	Nichols	2.82	146	5
25.78	\$ 102,414	46303	Dykstra	1.01	66	4
32.11	\$ 87,204	46202	Park	0.86	70	4
32.78	\$ 356,928	46100	Williams	3.52	90	13
33.88	\$ 165,282	46330	Reese Creek	1.63	80	7
43.54	\$ 374,166	35210	Lakeside	3.69	181	9
47.67	\$ 24,336	35131	Grimsley	0.24	58	2
61.25	\$ 19,266	44110	E Ingram Island	0.19	59	2
61.88	\$ 556,686	45500	McFarland	5.49	265	13
64.10	\$ 24,336	46301	Larson	0.24	78	2
71.01	\$ 50,700	46302	McCain	0.50	60	6
112.86	\$ 36,504	46305	Larkin	0.36	103	4
134.07	\$ 122,694	45600	Orchard Tract	1.21	235	7
151.22	\$ 18,252	46122	Crandall	0.18	46	6
165.18	\$ 270,738	46030	Foster	2.67	172	26
332.32	\$ 33,462	45601	Turner	0.33	139	8

AREA 4						
SCORE	COST	ROAD NUMBER	ROAD NAME	GRAVEL	ADT	RES
0.05	\$ 191,646	16050	Cardwell Hill	1.89	-	-
0.15	\$ 65,910	16500	Labare	0.65	-	-
0.18	\$ 55,770	16483	Lilly Hill	0.55	-	1
0.29	\$ 34,476	17591	Grover	0.34	-	-
0.39	\$ 25,350	07561	Glandon Gateway	0.25	-	-
0.45	\$ 22,308	17601	Derek	0.22	-	-
1.92	\$ 468,468	07560	Shingle Creek	4.62	45	2
3.02	\$ 125,736	05651	Wiles	1.24	19	2
3.56	\$ 185,562	16501	Blakesly Creek	1.83	66	1
3.73	\$ 482,664	17490	TumTum	4.76	60	3
4.15	\$ 147,030	06541	Pit	1.45	61	-
4.54	\$ 447,174	16530	Alexander	4.41	29	7
6.16	\$ 616,512	06540	Hoskins	6.08	95	4
9.58	\$ 35,490	17600	Long	0.35	34	1
9.86	\$ 1,014	15392	Linderman	0.01	-	-
9.86	\$ 1,014	17481	Blitz	0.01	-	-
15.04	\$ 123,708	06581	Ward	1.22	62	3
20.92	\$ 635,778	16520	Harris	6.27	133	10
22.28	\$ 172,380	06054	Price Creek	1.70	64	6
23.58	\$ 23,322	17486	McCullough	0.23	11	5
23.58	\$ 23,322	17482	Poster	0.23	11	5
29.69	\$ 188,604	17550	Happy Hollow	1.86	56	10

30.78	\$ 100,386	17590	Devitt	0.99	103	3
42.00	\$ 340,704	17055	Mary's River	3.36	159	9
95.72	\$ 420,810	17570	Norton Creek	4.15	212	19
248.52	\$ 15,210	17492	Summit	0.15	54	7

AREA 5						
SCORE	COST	ROAD NUMBER	ROAD NAME	GRAVEL	ADT	RES
0.22	\$ 44,616	48380	Haines	0.44	-	-
0.58	\$ 17,238	48403	W Alder	0.17	-	-
0.69	\$ 101,400	47201	Trout Creek	1.00	7	-
0.69	\$ 215,982	48401	Hayden	2.13	15	1
0.99	\$ 10,140	47431	Reed	0.10	-	-
2.01	\$ 398,502	47160	South Mountain	3.93	40	2
2.72	\$ 323,466	48150	Little Lobster	3.19	44	2
7.55	\$ 147,030	48180	Salmonberry	1.45	37	3
9.86	\$ 18,252	48615	Bummer	0.18	18	-
15.18	\$ 116,610	58150	Lobster Valley	1.15	177	-
15.22	\$ 188,604	48170	Fudge	1.86	41	7
27.57	\$ 238,290	47403	Honey Grove	2.35	73	9



Paving Assistance Program (PAP)

Private citizens have the option of requesting that the gravel road they reside on be upgraded to a paved road. Following is the procedure required.

1. **Eligibility**—Neighborhoods with gravel roads may be eligible for the Paving Assistance Program (PAP) if the following requirements are met:
 - a. The roadway(s) must be currently maintained by Benton County. Construction of new roads or paving of roads that are currently privately maintained will not be considered in the PAP.
 - b. The project must be free of complex design issues and must only involve minor right of way, earthwork and drainage work or other utility work.
 - c. The proposed paving project must connect to an existing paved road maintained by the County, in order to provide continuity of travel and maintenance.
2. **Property Owner Responsibilities**—Property owners are responsible for initiating the process, which may include informal meetings to determine preliminary support for the project. One property owner will be designated as the liaison between Benton County and the neighborhood and will be the single authority and contact point with the neighborhood. Property owners must partner with the County by paying the estimated cost of paving and shouldering materials, ditch stabilization materials and drainage improvements (construction materials) to be used on the project. If the project is approved Benton County will provide in-house manpower and equipment to construct the improvements. County funding and manpower may affect the time of the PAP.
3. **Paving Request Petition**--The first step towards having a gravel road paved is to obtain a Paving Request Petition. Blank petitions are available on the Benton County website, or at the Public Works facility at 360 SW Avery Avenue in Corvallis. The petition is used to assure property owner support for the project and their willingness to donate necessary right-of-way to complete the project. A detailed diagram showing cross sections of a typical gravel vs paved road is included with the petition, as well as answers to frequently asked questions.
4. **Property Owner Support**—In order for the Paving Request Petition to be considered complete, it shall have the signatures (i.e. support) of at least 60 percent of the home owners on the road in question.
5. **Preliminary Engineering**—Upon receipt of the petition, Benton County will prepare a conceptual road layout that shows the proposed road alignment, right-of-way, drainage improvements and potential easements. This allows the Road Department to develop preliminary cost estimates and will help to identify and explain potential impacts to property owners.
6. **Property Owner Confirmation**—The County will conduct a public information meeting within 90 days of receipt of a valid petition, during which the conceptual plan

will be presented to the petitioners. This meeting is designed to disseminate information and address questions regarding impacts to individual properties. After the public information session the Road Department will meet with property owners as necessary within 60 days to solicit input and answer questions about the proposed project. Upon validating that a minimum of 60 percent of the home owners support the project, the County will proceed with the process.

7. **Time and Material Cost Estimates**—The Road Department will develop time and material cost estimates for the completion of the project.
8. **Board of Commissioner Approval**—The Road Department will present the paving request, all pertinent supporting information and a Department recommendation to the BOC at a public meeting. Property owners and other interested parties will have an opportunity to express support or opposition to the project at this meeting.
9. **Funding**—Upon BOC approval, the project will be schedule in accordance with Benton County’s Capital Improvement Program
10. **Engineering**—Upon scheduled implementation, detailed engineering work will commence. Properties will be surveyed and plans developed identifying road alignment, right-of-way donation area, temporary and permanent easements, drainage improvements, and other impacts to private property. Road improvements shall be designed in accordance with minimum safety standards. All required permits will be attained by Benton County.
11. **Right-of-Way Acquisition**—Upon completion of right-of-way plats and associated legal descriptions, the County will acquire the needed right-of-way and easements.
12. **Construction**—Construction activities will begin in accordance with the established parameters of the CIP.