Washington State
County Road Administration Board
2404 Chandler Court SW, Ste 240, Olympia, WA 98504-0913
360/753.5989 – www.crab.wa.gov

January 1, 2019

The Honorable Steve Hobbs
Washington State Senator
Chair, Senate Transportation Committee

The Honorable Jake Fey
Washington State Representative
Chair, House Transportation Committee

Dear Senator Hobbs and Representative Fey:

In accordance with the requirement of RCW 36.78.070, the Washington State County Road Administration Board presents to the legislature this report of the activities of the agency for the year 2018. CRAB staff continues to promote the integration of engineering, information technology, and grants administration among the counties of the state. We believe this report will accurately indicate to you, and to the people of the State of Washington, the effectiveness of that effort.

The Board and its staff remain steadfast in their commitment to achieving your legislative mandates to provide statutory oversight of the state's thirty-nine county road departments, and in so doing, to provide to you the assurance that these counties' operations remain accountable in their stewardship of public assets and public trust.

Respectfully submitted,

BRIAN STACY, P.E., CHAIR

JOHN KOSTER, EXECUTIVE DIRECTOR

County Road Administration Board

CRABoard Members	Term Expires
Chair Brian Stacy, P.E., Pierce County Engineer	2021
Vice-Chair Rob Coffman, Lincoln County Commissioner	2019
Second Vice-Chair Lisa Janicki, Skagit County Commissioner	2021
Kathy Lambert, King County Council Member	2021
Al French, Spokane County Commissioner	2020
Grant Morgan, P.E., Garfield County Engineer	2020
Randy Ross, Grays Harbor Commissioner	2020
Bob Koch, Franklin County Commissioner	2019
Mark Storey, P.E., Whitman County Engineer	2019

County Road Administration Board Staff

Executive Director	John Koster
Executive Assistant Administration	Karen Pendleton Toni Cox, Engineering Technician Rhonda Mayner, Secretary
Deputy Director	Walter Olsen, P.E. Derek Pohle, P.E., Eng. & Adm. Support Specialist Randy Hart, P.E., Grant Programs Manager Mike Clark, C.E.T., Road Systems Inventory Manager Drew Woods, P.E., Compliance & Data Analysis Mgr.
Design Systems	Jim Ayres, P.E., Design Systems Manager
Information Services	Eric Hagenlock, Information Services Manager Jim Oyler, Web & Training Strategist Kathy O'Shea, Database Administrator Cameron Cole, GIS Administrator Scott Campbell, Systems Security Specialist

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From the Executive Director

In the last year, I have had the opportunity to travel around the state and visit almost all of our 39 counties. In the process, even though I have lived in Washington for my entire life, I saw parts of the state I had never seen. I never cease to be amazed by the diversity/uniqueness of our counties, from San Juan County, made up entirely of islands, to the vastness of Okanogan County, larger in mass than Rhode Island, Delaware, and the District of Columbia combined, not to mention the logistical issues those geographical differences create in maintaining and preserving their respective roads and bridges.

While the 39 counties face different geographic challenges, they face a greater common challenge. The challenge is the availability of the necessary funding required to maintain and preserve roads and bridges, exacerbated to a great degree by the ever-growing demand of meeting additional regulatory requirements. Of particular concern is the removal of fish passage barriers, estimated to cost the counties well over $4 billion.

Aside from the revenue provided from the 2015 Connecting Washington package, the funding from the MVFT to the 39 counties has been, for the most part, flat for the last 18 years. The counties road fund portion of the local property taxes now provides nearly twice as much revenue as MVFT funding provides for county roads and bridges. This is a dramatic shift away from what was once a 50/50 funding partnership between the state and the counties, and a shift, which creates significant funding inequity between the various counties. Continued reliance on funding preservation and maintenance on local roads and bridges through the property tax without the state once again becoming an equal partner is simply unsustainable.

It is not lost on the counties that the state also faces significant transportation funding challenges. However, regardless of the manner in which the state chooses to address transportation funding for the future, legislators should remember that counties are their partner in a "seamless inter-regional transportation system", and that system is under duress.

While CRAB is a state regulatory agency and administers three grant programs, as you can see in this report we also provide assistance to counties' Engineering, Information Technology and Design Systems. This past year staff has worked hard to redesign the CRAB website making it more informative, user friendly and interactive. We have experienced some staff and assignment changes and welcome to our ranks Drew Woods, P.E., as Compliance and Data Manager, Cameron Cole, GIS Administrator, and Scott Campbell, Systems Security Specialist. Eric Hagenlock was appointed as Information Services Division Manager and Derek Pohle, P.E. was appointed to serve as Engineering and Administrative Support Specialist upon the retirement of Jeff Monson,P.E.

I will conclude by saying that it is a privilege to work with an extremely professional staff that strives diligently to serve our counties and who are dedicated to fulfill the statutory mission of the County Road Administration Board.

Engineering Services

As the County Road Administration Board begins its 53rd year as a state regulatory agency, the Engineering Services Division must continue to provide a diverse mix of specialists who provide quality training and assistance across an even wider spectrum of subject matter. With that duty looming larger every year, CRAB lost a valuable member of our staff this year.

After thirty-eight years working in Civil Engineering, the County Road Administration Board said farewell to Jeff Monsen, P.E., when he retired June 30, 2018. Jeff spent a short period of time working for a private consulting firm before and immediately after completing his Civil Engineering degree from the University of Washington in 1980. In 1981, he was hired by Whatcom County to work in both Traffic Engineering and Road Design/Construction. After four years with Whatcom County, and shortly after he obtained his P.E. license, he was hired by Skagit County. Due to a number of factors during his six years at Skagit County (1985-1991), Jeff actually held four different titles: Traffic Engineer, County Engineer, Assistant Director-Administrator and Assistant Director-Solid Waste. In 1991, Jeff returned to work for Whatcom County. During the next three years, he once again held four titles due to significant organizational changes occurring at the time. He finished his MBA from the City University of Seattle in 1992. In 1994, Jeff was appointed Whatcom County Public Works Director and held that position for thirteen years, until his move to CRAB in January of 2007 as the Intergovernmental Policy Manager. Jeff was involved in a large number of projects and information gathering efforts that have proven to be of great value to the counties of Washington State. He also earned a number of recognition awards, including WSACE President's Award in 2012 and Washington Urban County Engineer of the Year in 1996. Jeff also served as President of WSACE Western/Puget Sound District in 1990/1991 and President of WSACE in 1999-2000. Jeff said, "It's been my honor and pleasure to have worked with so many good and talented people over the years. But the past eleven years with CRAB will certainly be the ones I remember most – working with CRAB staff, spending time with county staff all over the state, and all the opportunities to make a difference".

CRAB continues to provide on-going resources to County Engineers and their staff members, drawing from the echelons of the County Engineers to fill vacancies on occasion. Derek Pohle, P.E., CRAB's Compliance and Data Manager and former County Engineer for both Whitman and Grant Counties, assumed the duties of Engineering & Administrative Support Specialist on July 1, 2018. CRAB has once again drawn from the County Engineer ranks for our newest member as we welcome Drew Woods, P.E., former CRABoard member and County Engineer from Columbia County, to take on the responsibilities of the Compliance and Data Analysis Manager position with Derek's promotion. Congratulations Derek, and welcome to Drew as our newest engineering staff member.

The primary responsibilities of the Engineering Services Division are the maintenance and updating of summary reports, guidance materials, and model documents, and the provision of training to County Engineers and their staffs. Through a combination of county visits and CRAB sponsored training held in Olympia and around the state, the

Engineering Services Division, under the direction of Deputy Director Walt Olsen, P.E., has brought over 500 hours of informative training to the members of Washington State Association of Counties and Washington State Association of County Engineers.

For many years, CRAB has provided County Engineers and other county Public Works staff a variety of information resources. One of these is the County Engineers' and Public Works Directors' Desk Reference, which contains guidance on a variety of technical and administrative issues affecting county engineering functions. In addition to providing this manual as a hardcopy reference document, a major re-design of the manual was released November 2016, which takes advantage of current internet technology through inclusion of over 1,800 internet "hotlinks" embedded within the document's text. While the revised manual may contain less written detail on most topics and is only half the number of pages from the previous version, the total number of topics covered has actually expanded. When the document is open as an electronic file on a computer connected to the internet, the embedded "hotlinks" significantly expand the amount of information immediately available to the user. In order to ensure current information is provided, several updates have been released, including the most recent in April 2018.

CRAB continued the County Engineer/Public Works Director training sessions this year and conducted two 3-day training sessions on May 1-3 and December 4-6, 2018 at the CRAB office, totaling over 400 training contact person-hours. This training is constantly being revised to reflect the ever-changing climate of engineering, social, political, and environmental concerns. These intense sessions review the duties and responsibilities of the counties and the County Engineer. Another aspect of this training has been developed to allow modules to be provided directly to a county or gathering of multiple counties at their site, and customized for their specific needs. Two of these customized sessions were conducted during 2018 in Stevens and Snohomish Counties, totaling 1354 training contact person-hours. CRAB has also delivered condensed three-hour trainings at WSAC County Leaders Conferences in the past that are well attended by County Commissioners and Councilmembers, County Engineers, and senior staff. Comments were very positive and CRAB looks forward to future opportunities to continue this forum.

In no place is the diversity of the engineering field more evident than in the complexity and intricacy of the duties of the 39 County Engineers statewide. Each year, CRAB recognizes engineers and staff who have made significant contributions to the engineering community and their county.

In June, at the Washington State Association of County Engineers Annual Conference at Alderbrook, John Koster, Executive Director of the County Road Administration Board, presented several annual awards. The County Engineer of the Year award was presented to Matt Rasmussen, P.E., Benton County Engineer. Kathleen Neumann, Franklin County, received the Project Manager of the Year Award and Jeff Marshall, Whitman County, received the Program Manager of the Year Award. Congratulations to this year's winners for their outstanding service and excellent program delivery to their communities.

The Engineering Services staff, most of whom hold Professional Engineer licenses, is comprised of Engineering and Administrative Support Specialist Derek Pohle, P.E.; Compliance and Data Analysis Manager Drew Woods, P.E.; Grant Programs Manager Randy Hart, P.E.; and Road Systems Inventory Manager Mike Clark, CET and are directly responsible for the following functions:

- Administration of the Rural Arterial Program, the County Arterial Preservation Program, and the County Ferry Capital Improvement Program;

- Maintenance of the County Road Log and the computations and updates to the distribution of the counties' share of the motor vehicle fuel tax;

- Management of the reports and other information necessary for recommendations related to the Annual Certificate of Good Practice for each county;

- Guidance and research on statutory and regulatory issues affecting county road and public works departments;

- Comprehensive and in depth training for County Commissioners, County Engineers, and their staff;

- Assistance in representation of county engineer interests on a variety of state-level committees and task forces;

- Design and traffic engineering assistance to counties, as requested, including consultant selection assistance;

- Liaison services on behalf of county engineers with various state agencies, especially the State Auditor's Office and Local Programs Division of WSDOT.

CRAB acts as a clearinghouse for information requests, questions, and the exchange of ideas. With an emphasis on good communication, Engineering Services staff has worked with state transportation officials, resource agencies personnel, and public works departments as they strive to meet the transportation needs of their counties.

Design Systems

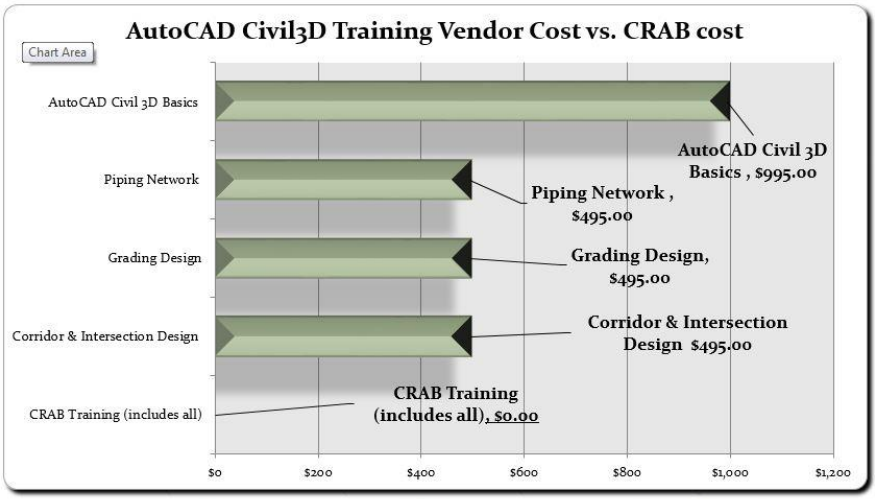
A critical function of the CRAB mission is to provide Washington State counties with products, services, and technical assistance that enable them to comply with standards of good practice and to operate in an efficient and effective manner. The CRAB Design Systems Program has consistently provided assistance in that endeavor to Washington County personnel and the citizens benefit from the application of the latest technological design system software since 1985.

CRAB Design Systems provides Washington State counties with state-of-the-art engineering design system software support and training at *no cost*. Key to our counties successful use of the design system software is effective training and support and CRAB prides itself in offering our counties training courses suited for both engineering and surveying professionals. These courses reaffirm our commitment to our county partners. No one can match the level of knowledge along with real life experiences taught by our professional licensed engineer trainer, Jim Ayres, P.E.

In addition to systematic instruction using practical design solutions, county users learn time efficient shortcuts as well as collaborative design techniques. Each student receives comprehensive training manuals and computer data files that can be taken back to their offices to be used as valuable reference guides, providing the skillset that can be applied immediately upon return back to their everyday duties. Small class sizes of 8 to 10 people ensure that counties receive the maximum amount of attention from the instructor.

For a county training financial savings example, using just the quarter of February to April 2018, the Design Systems program implemented ten training person days, for 35 county personnel, representing nine different counties.

As mentioned above, the total cost to each county is $0 to attend. If they attended an AutoCAD Civil 3D basic course from a local vendor, it would cost $995. The basic class does not include Corridor & Intersection Design ($495), Grading Design ($495), or Piping Network Design ($495). CRAB provides all of the aforementioned training at no charge.



Cost Comparision: February to April 2018 the Design Systems Program trained **35** county personnel.

Vendor: $2,480 (Basic class + All the rest of training) x **35** county students = **$86,800**.

CRAB: AutoCAD Civil3D training cost = **$0.00** *(CRAB allocates 1 FTE to conduct all AutoCAD Civil3D Training.)*

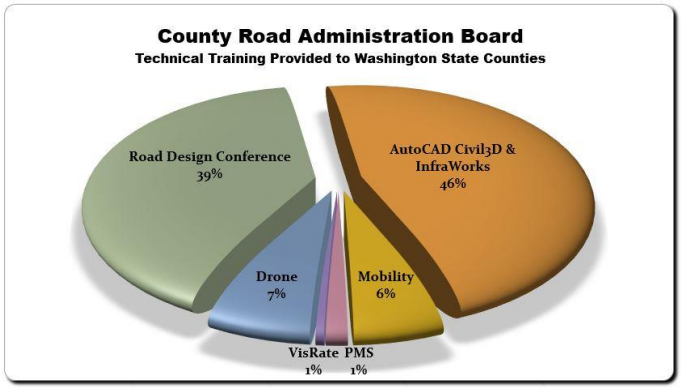
CRAB also conducts UAS (aka Drone) Training for the counties. As this is such a new technology, there are currently no vendors offering this type of training, so we are unable to show a cost comparison other than we feel it is *priceless!*

Other savings and increased competence are accomplished through a county's use of the Design Systems website, design forum, and the annual Road Design Conference.

This year's Road Design Conference was the 29th annual event and was held October 31-November 2, 2018 in Chelan at Campbell's Resort, with 75 participants representing 22 counties. On Wednesday, Autodesk provided technology training as a pre-conference event. In addition, three other vendors showed their products and sponsored a meal, social or break during the conference. As always, county design staff made presentations, shared their challenges and solutions, and successfully networked with their other county counterparts. Awards were handed out to counties for the best project designs for the year. There was *no cost* to the counties to attend this conference.

Design System Software in use by Washington State counties.

This fall, the CRAB Design Systems program reached out to all counties and invited them to participate in our **Design Systems Software Survey**. Our intent was to obtain information about the software applications that all counties are currently using. We are pleased to announce that we received submittals from all 39 counties.

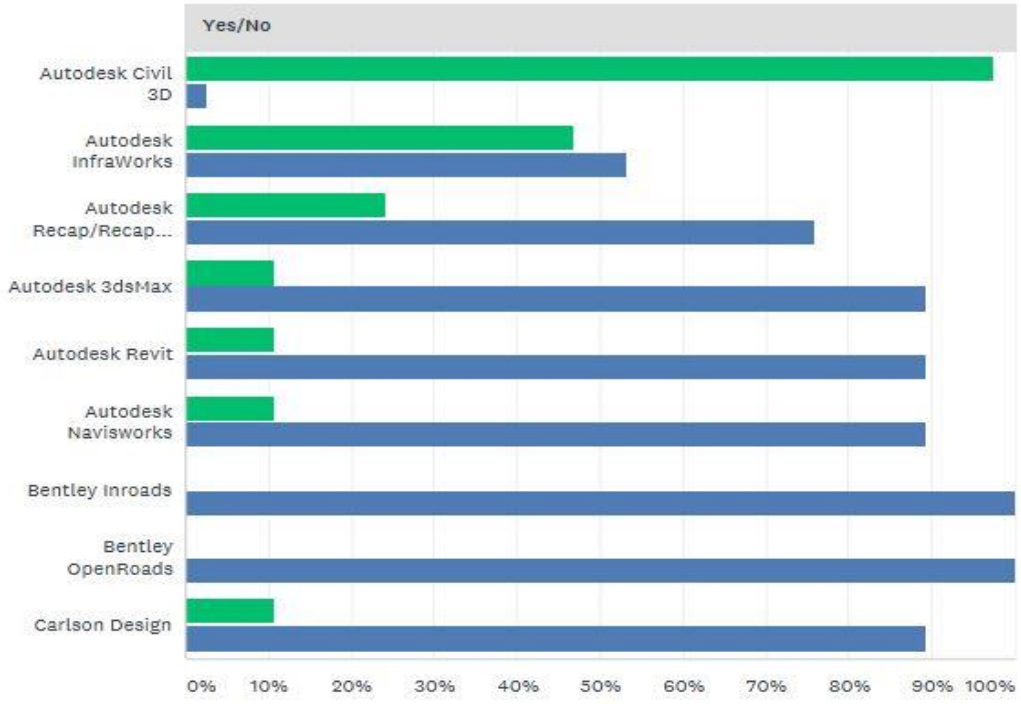


Jim Ayres P.E., CRAB & Randy Evans, Thurston County

The survey results were presented at our 29th Annual Road Design Conference. As the graph below shows, there have been significant changes in both hardware and software since our last survey, conducted back in 2007. In addition, since that time we have witnessed the vast majority of the counties migrate over to totally different design system software, as well as incorporating numerous other software applications into their current workflow, in order to produce their respective projects. Therefore, the information the counties submitted is vitally important to our program so that we can better support them.

In addition, it is our hope from these findings that all Washington State counties will also benefit from the survey by getting a clearer picture of what other counties around the state are using for their software applications. That way, we all can learn, share and collaborate with each other in order to synergize and become better as a whole versus struggling as one.

Answered: 39 Skipped: 0



Information Services

The Information Services (IS) Division at CRAB is a team of Information Technology (IT) professionals dedicated to programs and initiatives, both at CRAB and in our counties, which protect and improve the public's investment in our transportation infrastructure.

County Road Administration Board appointed a new IS Division Manager, Eric Hagenlock, in January 2018. Eric began with CRAB as an Applications Specialist (ITS1) in 2005, and worked with the IT team to grow the Agency software suite from one application to seven, including: Mobility©, Mobility Annual Reporting System (MARS), VisRate, SignRate, RAP Online, CRAB Annual Reporting System (CARS), and the County Transportation Metrics Dashboard. Eric's primary goal is to align IS strategic direction with the overall Agency strategy and mission to ensure the safe and efficient movement of people and goods over county roads.

In July 2018, CRAB recruited and hired Cameron Cole as the Agency GIS Administrator. Cameron has a B.S. degree in Environmental Sciences from Oregon Institute of Technology. Additionally, Cameron had previously worked for two years with Benton County Public Works as a GIS Technician and Road Log Manager. Cameron's hiring is part of the new strategic direction for CRAB Information Services, and his background as a county public works employee gives the IS Team crucial perspective.

October 2018 brought yet another new IS Team member in Scott Campbell, Systems Security Specialist. Scott fills a mission critical skillset for Agency security, network/systems administration, and disaster recovery. Scott comes prepared with two years at SPSCC and industry certifications for networking. Scott had previously worked for private sector in Systems Security, as a contractor troubleshooting and installing various solutions for retail and hospitality businesses.

Information Services Strategic Goal

The goal of CRAB's strategic plan for Information Services is to assist counties in developing uniform and efficient transportation-related IT resources by providing, developing and supporting a full range of information tools and services for all aspects of transportation-related public works operations. This strategic goal has four objectives.

Objective one: *Ensure effective use of IT tools through development or procurement of, and support and training for, appropriate applications and software*. CRAB continues the effort to replace its flagship product, Mobility©, with GIS-Mo, a commercial-off-the-shelf (COTS) enterprise asset management system. The major objectives of this project are to add geospatial data to the linear referencing system (LRS) used in Mobility©, add mobile data collection capabilities, and integrate efficiently with information systems outside of CRAB. Visualizing spatial data will become another tool for investigating budgets, funding,and where state and federal dollars are being utilized. It also will allow all counties to have access to web mapping, mobile mapping applications and spatial editing for updating and maintaining the County Road Networks and road assets.

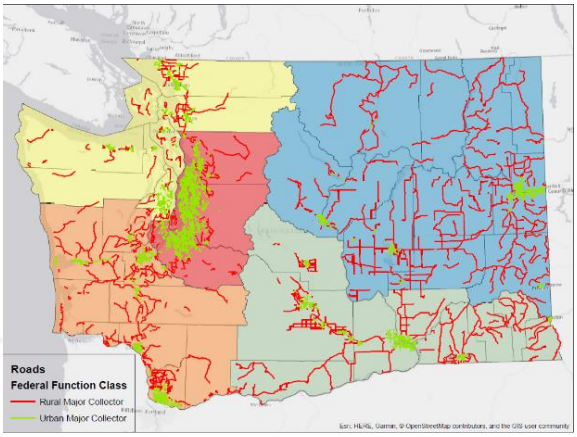
"*The application of GIS is limited only by the imagination of those who use it*".

~ Jack Dangermond, Esri.

CRAB is envisioning a future where all counties are able to utilize asset and maintenance management through GIS to make data driven decisions and better serve Washington State. The decision to use COTS instead of the long practiced in-house development was born from the desire to continue to offer state-of-the-art software applications with minimal increase to the IT budget, to keep pace with the rapidly advancing need of county staff, and to have systems capable of managing the approximately $900 million spent on nearly 40,000 miles of county roads annually.

CRAB is targeting the transition from Mobility© to occur in 2021. Over the next three years, CRAB will develop a sustainable budget, work with vendors to configure the COTS system to meet county needs, develop the migration routine from Mobility© to the new system, accomplish the necessary train-the-trainer between the vendor and CRAB staff, and train the 39 counties.

CRAB IT also overhauled the Agency website in 2018. The updated website brings a mobile first responsive design, improved search capability, accessibility, and many more modern features. The new website effectively responds to informing and providing user content pertaining to CRAB and Washington State County initiatives. CRAB's Information Services team accomplished another great effort this year, thanks in part to great participation by all of CRAB staff.



***Objective two**: Maintain a high level of professionalism in the use of IT in county road departments through training and support.* CRAB has several resources for training and support available to Agency IT stakeholders. Formal training is typically offered several times a year at the CRAB offices and at remote facilities. In 2018, CRAB delivered approximately 648 labor hours of Mobility© training.

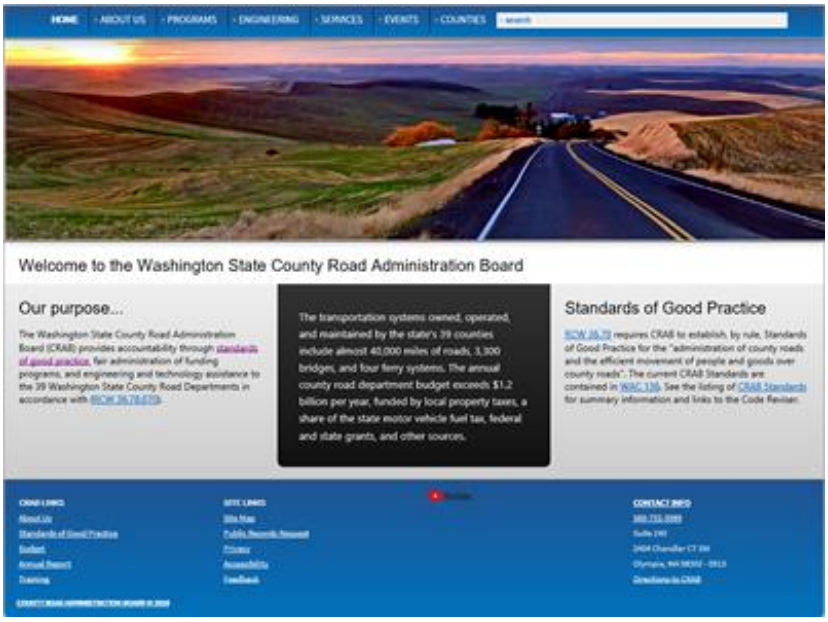
CRAB also performs support through email and phone, which is facilitated by the Agency helpdesk system CRAB-NET. CRAB-NET reports 411 tickets were submitted to helpdesk, and 420 tickets were resolved in 2018.

***Objective three**: Enhance the effectiveness of county personnel in their projects and initiatives through IT consultation.* CRAB staff is constantly providing consultation to counties, either by participating in workgroups, committees, councils, etc.; or through personalized one-on-one consultation. In 2018 more than 100 labor hours of consultation services were received by counties in MVFT, Mobility©, pavement rating, pavement management, systemic safety project selection, etc.

***Objective four**: Promote cooperative communication, information exchange, and IT uniformity through conferences, workshops, and website activities.* CRAB Information Services organized, led, and completed two workgroups in 2018 to facilitate the development of GIS-Mo. The first was the Data Standards Workgroup, which focused on Mobility© inventory data, specifically what

changes, if any, would be required during the transition to GIS-Mo. The Data Standards Workgroup saw participation from 15 of 39 Washington State counties.

GIS-Mo also brought about the GIS Specifications Workgroup. This workgroup's objectives included determining what technologies can be leveraged to integrate county and CRAB GIS. The GIS Specifications Workgroup saw participation from 20 of 39 Washington State counties.



Grant Programs

County Arterial Preservation Program (CAPP) and Rural Arterial Program (RAP)

The CAPP and RAP programs utilized a total of $16.8 million and $19.4 million, respectively, to make significant improvements to the strength, survivability, and safety of county arterial roads in 2017. These CRAB-managed programs improved freight haul and overall access to agricultural markets serving local economies. The two programs complement each other with their unique focus on different road deficiencies.

County Arterial Preservation Program - CAPP

The funds that were given to Washington State Counties to address their pavement preservation needs in 2017 originated from three sources: 1: The monthly deposit of fuel tax receipts into the County Arterial Preservation Account (CAPA); 2: Direct transfer from the Transportation Partnership Account (TPA) into the CAPA every July, and 3: Direct transfer from the Motor Vehicle Account (MVA) into the CAPA each quarter. The total expended in 2017 by counties from these three funding sources was $16.8 million (see Table H). Adding county funds, the total expended on pavement preservation was $78.7 million. The pavement preservation work accomplished by counties in 2017 with the assistance of the three state funds greatly reduced the need for high cost maintenance and repairs in the future.

Freight and Goods Routes Tonnage Designations:

T-3 300,000 to 4 million tons per year
T-4 100,000 to 300,000 tons per year
T-5 at least 20,000 tons in 60 days and less than 100,000 tons per year

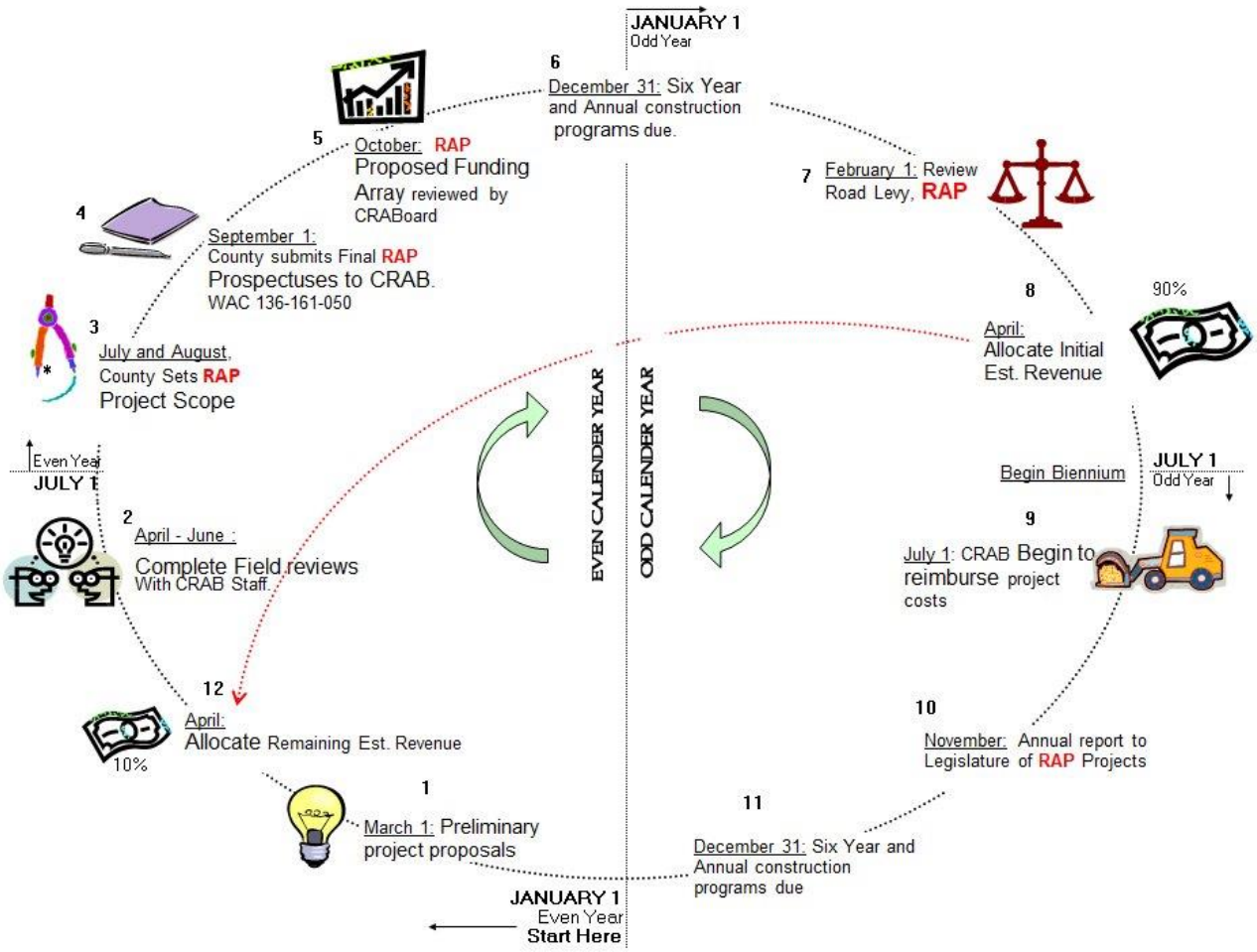
Rural Arterial Program - RAP

When county rural roads endure the heightened impacts of growth and freight haul, they often also experience a safety crisis due to deficient geometry. Width, structural and alignment deficiencies cannot be addressed through a resurfacing project. Fortunately, the RAP was created in 1983 to address these additional deficiencies. The counties used $19,383,784 of these funds in 2017 (see table C) to fix these conditions, increasing haul and traffic capabilities and improving safety.

RURAL ARTERIAL PROGRAM EXPENDITURES BY COUNTY
AND LEGISLATIVE DISTRICT IN 2017

COUNTY	LEG DIST	RATA $'S RECEIVED	COUNTY	LEG DIST	RATA $'S RECEIVED
Adams	9	10,928	Lincoln	7	53,095
Asotin	9	276,379	Lincoln	13	9,353
Benton	16	140,088	Mason	35	802,740
Chelan	12	2,205,366	Okanogan	7	671,972
Clallam	24	1,035,209	Okanogan	12	187,650
Clark	18	112,573	Pacific	19	941,344
Columbia	16	994,001	Pend Oreille	7	28,299
Cowlitz	19	117,227	Pierce	2	9,179
Douglas	12	147,352	Pierce	26	67,879
Ferry	7	1,291,437	Pierce	31	1,359,341
Franklin	16	30,850	San Juan	40	126,360
Garfield	9	15,231	Snohomish	39	671,071
Grant	13	1,779,857	Spokane	4	978,435
Grays Harbor	19	71,474	Stevens	7	29,583
Island	10	109,277	Thurston	2	20,616
Jefferson	24	730,349	Thurston	20	1,206
King	45	688,794	Wahkiakum	19	37,609
Kitsap	35	1,314,216	Walla Walla	16	20,622
Kittitas	13	96,375	Whitman	9	840,534
Klickitat	14	20,000	Yakima	14	201,088
Klickitat	15	618,853	Yakima	15	2,617
Lewis	20	517,321			
					19,383,748

RURAL **A**RTERIAL **P**ROGRAM
BIENNIUM CYCLE



History of RATA Funds per County:

REGION	COUNTY	TOTAL RATA APPROVED	TOTAL RATA SPENT	% SPENT	MILES BUILT
NE	Adams	21,627,284	19,025,861	88%	100
NE	Chelan	27,387,900	22,574,978	82%	53
NE	Douglas	28,142,035	25,221,288	90%	56
NE	Ferry	23,808,330	16,342,056	69%	65
NE	Grant	31,077,068	26,994,428	87%	177
NE	Lincoln	28,284,920	23,310,052	82%	113
NE	Okanogan	23,337,082	16,093,833	69%	56
NE	Pend Oreille	16,777,378	14,870,833	89%	80
NE	Spokane	34,966,191	24,697,911	71%	51
NE	Stevens	29,232,185	26,580,130	91%	118
NE	Whitman	29,470,512	21,905,680	74%	104
NE REGION TOTALS		$ 294,110,885	$ 237,617,051		973
NW	Clallam	10,810,576	9,711,045	90%	16
NW	Island	15,351,700	12,787,075	83%	20
NW	Jefferson	7,475,340	5,768,426	77%	14
NW	Kitsap	13,026,520	10,680,231	82%	29
NW	San Juan	8,520,008	6,901,259	81%	19
NW	Skagit	10,232,654	6,162,591	60%	21
NW	Whatcom	12,932,182	11,879,060	92%	38
NW REGION TOTALS		$ 78,348,980	$ 63,889,686		157
PS	King	15,334,725	13,974,292	91%	27
PS	Pierce	16,723,566	14,162,050	85%	28
PS	Snohomish	15,494,691	12,846,880	83%	20
PS REGION TOTALS		$ 47,552,982	$ 40,983,222		76
SE	Asotin	15,128,911	10,351,543	68%	27
SE	Benton	20,422,553	18,489,252	91%	53
SE	Columbia	15,612,671	11,711,963	75%	41
SE	Franklin	14,761,986	12,477,694	85%	43
SE	Garfield	14,797,743	13,319,310	90%	47
SE	Kittitas	16,009,495	14,800,744	92%	33
SE	Klickitat	21,816,853	18,085,504	83%	84
SE	Walla Walla	19,069,590	15,945,161	84%	37
SE	Yakima	24,887,791	19,253,781	77%	50
SE REGION TOTALS		$ 162,507,593	$ 134,434,953		415
SW	Clark	12,713,718	9,715,282	76%	16
SW	Cowlitz	14,478,406	12,099,392	84%	28
SW	Grays Harbor	15,623,668	13,463,161	86%	20
SW	Lewis	11,140,905	8,466,576	76%	25
SW	Mason	12,880,425	10,333,038	80%	38
SW	Pacific	12,335,933	10,352,524	84%	55
SW	Skamania	3,179,868	2,970,885	93%	14
SW	Thurston	16,129,268	12,182,349	76%	32
SW	Wahkiakum	8,291,126	4,832,653	58%	38
SW REGION TOTALS		$ 106,773,317	$ 84,415,862		265
STATEWIDE TOTAL		$ 689,293,757	$ 561,340,772	81%	1,885

2017-2018 Grant Program Projects

Okanogan County-Park City and Joe Moses Bridges

Joe Moses Road is a rural two-lane road that provides access to range lands and homes on the Colville Reservation. There is no alternate access to these areas.

Park City Loop Road on the other hand is, as the name suggests, a loop that connects Highway155 with Gold Lake Road. This road accesses rural ranches and dispersed homes.

The center pier cap on bridge B-15 (Joe Moses Road) had rapidly deteriorated to the point that a five ton weight limit had to be imposed. Bridge B-3 (Park City Loop Road) had deteriorated in the same fashion, but was more severe and had to be closed. Federal funds to replace the structures were secured in December 2015, with RAP matching funds following the next month.

Design for both bridges proceeded quickly and the project was advertised in July 2016. This quick advancement to construction was made possible by the funding agencies, the BIA and Colville Tribes, and a dedicated consulting engineering firm. Though construction was somewhat hampered by high water and a very cold snowy winter, both bridges were still able to be opened early in 2017.

Contractor: West Company, Inc.

Total Cost:	**$1,850,454**
RAP:	$261,484
Federal	$1,575,960
County:	$13,010

King County-West Snoqualmie Valley Road

West Snoqualmie Valley Road is a busy farm-to-market route for the Seattle-Bellevue metropolitan area. The improved segment was originally constructed by private property owners as a farm access road in the early 20th century. It was established as a county road in 1933 as the Solberg Connection Road and served the many dairy farms along the road and the Carnation Farm for processing and distribution of their milk products. The failing roadway structure consisted of a thin layer of asphalt (three inches) over a shallow base (one inch). The pavement exhibited many areas of severe fatigue cracking along both wheel paths.

During road excavation a solid timber layer was discovered. Investigations revealed that these timbers were part of a buried plank road. The Department of Archeaology and Historic Preservation (DAHP) recorded these old structures on a Washington State Archaeological Site Inventory Form prior to removal. Other historic properties in the vicinity of the project include the Vincent Schoolhouse (1905) which is a King County Landmark, the John Hilmer Gustovson Barn which is listed on the Washington Heritage Barn Register and other dairy farms attesting to the historical significance of that industry along this corridor.

The road was reconstructed with a geogrid base reinforcement, six inches of crushed surfacing and six inches of asphalt. The project added drainage features including six box culverts, five 24 inch culverts and a short span bridge. Public presentations on the history of the road that focused on the timber road elements uncovered during construction were positively received. The 'Blog Entry' on the project received the most views of any article ever posted there.

Contractors: **Scarsella Bros., Inc.**

Total Cost:	**$6,749,039**
RAP:	$4,093,020
Federal:	$2,204,567
County:	$451,452

Benton County-Nine Canyon Road 2

Nine Canyon Road is a major farm-to - market road with heavy truck traffic, especially during harvest season. The road is also used as local access to the Columbia River for recreational purposes, including the wine industry located down at the river. In the last few years the traffic has increased due to the construction and maintenance of wind farms located along the route. Due to these agricultural, recreational and industrial needs, this route from CR397 to Coffin Road was identified as a corridor with high local significance and scheduled for reconstruction to a safe all weather route for all modes of vehicular traffic.

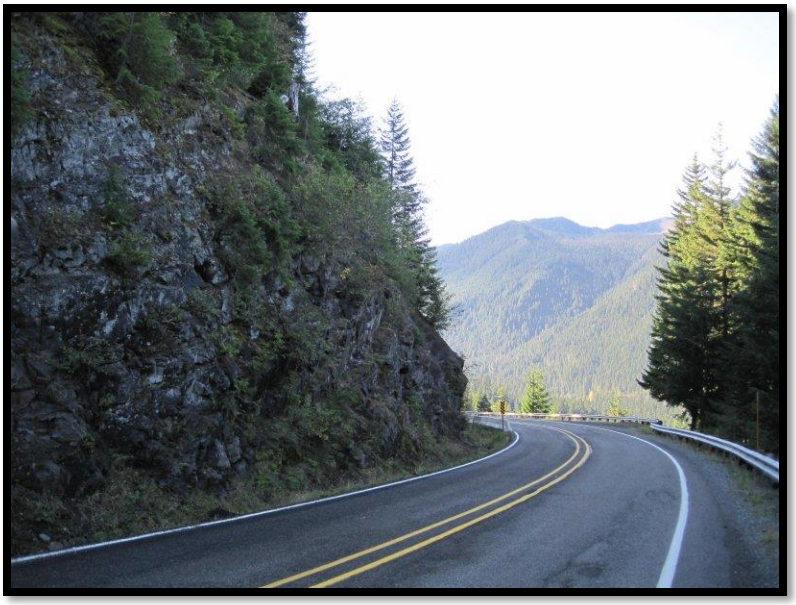
Improvements that were accomplished included curve realignment, grading steep sections out to increase sight distance, and widening the roadway. After grading, the road structure was rebuilt with 0.8 feet of base rock, 3.5 inches of crushed rock and 3.5 inches of hot mix asphalt to meet the demands of harvest time truck loading.
All of these improvements were possible with the help of RATA funds. The new roadway is now easier to maintain and much safer for trucks and other vehicles that share the facility.

Contractor: Scarsella Bros., Inc.

Total Cost:	**$2,187,482**
RAP:	$1,968,175
County:	$219,307

Pierce County-Crystal Mountain Boulevard

Crystal Mountain Boulevard East provides access to the Crystal Mountain Ski Area from State Route (SR) 410 and west-side access to the Norse Peak Wilderness and the Pacific Crest Trail. Large traffic volumes are generated by activities that include photography, sightseeing, RV and backcountry camping, hiking, wildlife viewing, and spa/fitness facilities. The skiing industry generates the greatest economic impact, from lift ticket sales to dining and lodging. Catastrophic failure of this road would mean loss of business during an entire ski season, which employs about 35 people year-round and 340 people during the ski season.

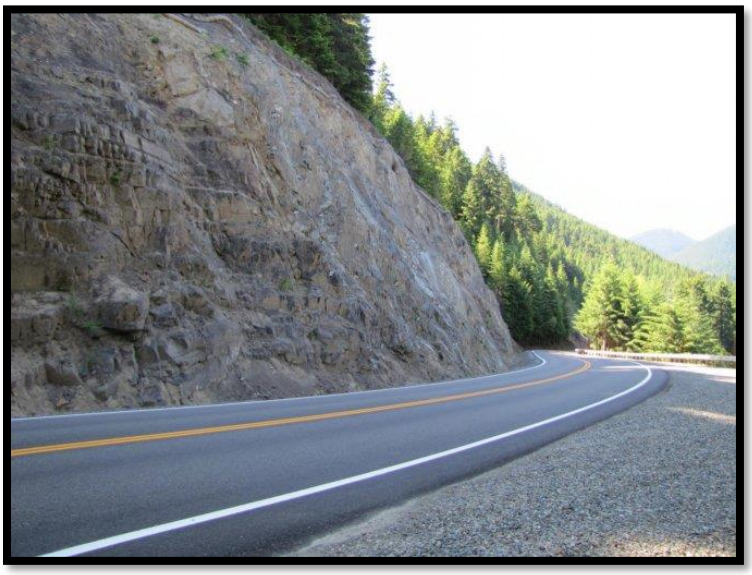


Seasonal freeze/thaw cycles, snow and ice removal operations and regular snowplowing stressed the roadway pavement over the years. Heavy winter ski resort traffic also has its damaging effect. The existing culverts that cross this roadway were made of corrugated metal pipe installed in the 1960s and were nearing the end of their expected lives. The curved section of roadway prevented safe sight distance and restricted the reaction time needed for motorists. Upkeep of the road was an expensive maintenance task.

Improvements to the 6.1 mile long road included resurfacing with hot mix asphalt, replacing all existing guardrail, extensive ($1,000,000) rockslide protection work, and replacing three structural plate culverts with bridge structures. Three 8-foot diameter metal pipe culverts were replaced with concrete box culverts. These have an opening width of 32 feet and heights that vary from 10 feet to 19 feet. Other project elements included removing and replacing approximately 4.4 miles of guardrail.

Contractor:
Strider Construction Company

Total Cost:	**$13,573,334**
RAP:	$4,200,000
FLAP Funds:	$9,367,716
County:	$5,618



Garfield County-Gould City Mayview Road

This road was a major farm-to-market and Lower Granite Dam Access gravel road. Commercial and Industrial traffic accessing the dam has increased significantly in the last 10 years and this improved road will continue to provide for a much improved access to the dam during winter months. It will also encourage more federal employees to live in Pomeroy because of the improved access. This project was the completion of the third out of four phases planned. The travel time from Pomeroy to this part of the county is now decreased by more than 15 minutes.

The existing road consisted of a weak gravel structure and gravel surface with steep slopes and no safety devices. The county looks ahead to completion of phase four so that the roadway serving the Port of Central Ferry/SR 127 and Pomeroy will remain all-weather.

The public is very pleased with the project as it significantly improves access to the Dam and farm to market traffic.

Contractor: **ML Albright**

Total Cost:	**$1,901,130**
RAP:	$1,492,200
County:	$408,930

Kitsap County-Glenwood Road 2

Glenwood Road is a two lane, north-south route between SW Wildwood Road and SW J H Road in South Kitsap County. This segment of roadway had substandard lane and shoulder widths, as well as substandard vertical curves. The existing roadway cross section consisted of two nine-foot lanes with three-foot gravel shoulders. The pavement was deteriorated asphalt and the roadside drainage was inconsistent with no defined course directing it away from the roadway. At the time of submittal for RAP funding, the traffic volume was 1,750 cars per day, including a high number of heavy trucks at 255 per day.

Since the proposal followed 3R scope, the project improvements consisted of resurfacing, restoring, rehabilitating the existing roadway to design standards, and not increasing capacity. Changes to the alignment and vertical profile were accomplished to improve deficient curves. The roadside was cleared of safety hazards such as trees, utility poles, mail boxes signs and abrupt culvert ends. Given the high traffic volume, the road was strengthened with crushed rock, a two-inch hot mix asphalt leveling course and a two-inch wearing course. The road was also widened from 24 feet to 34 feet, which included six-foot shoulders. This also greatly improved safety for bicyclists and pedestrians.

Contractor:
Sound Excavation, Inc.

Total Cost:	**$1,917,369**
RAP:	$1,720,285
County:	$197,084

Whitman County-Farmington Road

Farmington Road is a high priority road in northeastern Whitman County, and connects many farmers and businesses to SR 27, thereby enhancing commuter travel and transport of commodities to market. It is also the transportation link between the towns of Farmington and Tekoa. Due to relatively high traffic and truck volumes, the asphalt driving surface had deteriorated to a point that the county incurred unreasonable maintenance costs compared to other roads in the county system. The county determined an overlay was needed to prevent deeper and very expensive repairs.

During the work, the roadway was widened from 22 feet to 26 feet. A new asphalt overlay was constructed, and new permanent striping was applied after the overlay was complete. The result is a more durable road and a safer driving experience for local commuters and farmers.

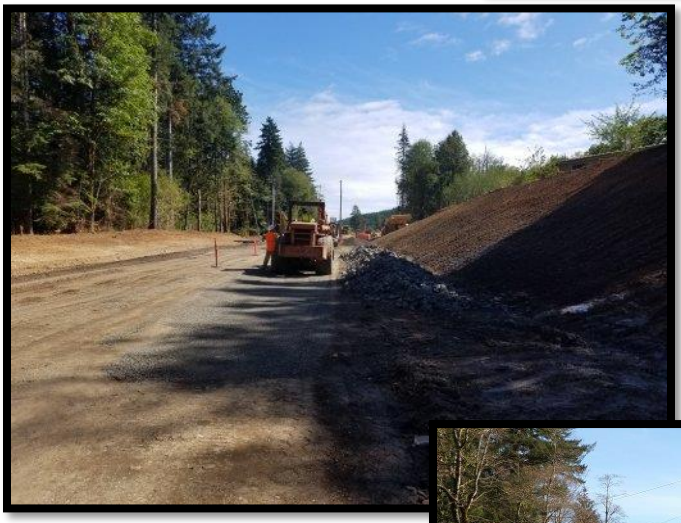
Contractor: Central Washington Asphalt, Inc.

Total Cost:	**$1,007,153**
RAP:	$750,000
County:	$14,517
Federal:	$242,636

Mason County-Cloquallum Road

Cloquallum Road is an 18.8 mile long rural collector that functions as the main truck route from Shelton to Elma-West Mason County to east Grays Harbor County. The project section featured a large sharp curve that was the site of several single vehicle collisions in the past. The overall goal of this project was to bring this section of roadway up to current county road standards, thus reducing the amount of accidents.

In addition, the existing roadway was a narrow 22 feet wide, had many localized areas of failing subgrade, and the guardrail had been damaged and needed to be replaced. Side slopes did not meet height requirements and needed to be flattened or barriers installed. Improvements included a new 1.5-foot thick gravel base and paved road section, new beam guardrail, widened roadway to 34 feet, flattened side slopes to 4:1 or flatter, and improving horizontal and vertical curves to meet current sight distance requirements.



Contractor: Active Construction, Inc.

Total Cost:	**$2,393,508**
RAP:	$900,000
County:	$1,493,508

Grant County-9-NW Road

9-NW is a rural minor collector, is the first east-west connector south of Quincy and carries considerable agricultural and livestock traffic. This road carries a high percentage of truck traffic and is subject to seasonal weight restrictions. The existing roadway was only 22 feet wide and did not meet current design standards.

The roadway surface was ground up and widened to 34 feet, with crushed surfacing applied by contract with Tommer Construction. This greatly enhanced load carrying capacity, and safety and mobility for wider farm equipment and other vehicles. County Forces constructed Class A Bituminous Surface Treatment (BST), which worked very well. Drainage was also improved. Public feedback has been very positive.

Contractor:
Tommer Construction

Total Cost:	**$1,015,828**
RAP:	$750,000
County:	$265,828

Lincoln County – Miles Creston Road Bridge Replacement

The Miles Creston Road is Lincoln County's only minor arterial. It serves as a cutoff from SR 2 to SR 25 and accommodates freight and goods transport. It also provides the major access to Lake Roosevelt and the many small developments and communities along the lake. The fracture-critical Miles Creston Bridge was structurally deficient, functionally obsolete, narrow and weight restricted.

Prior to replacement, the bridge was limited to one way traffic and a reduced speed. The need for the bridge replacement was to allow legal weight vehicles to use this route without going 325 miles out of their way. A shoo-fly detour was constructed to accommodate the normal traffic.

A new prestressed, precast concrete bridge was installed on a pile foundation. This was accomplished in one construction season and under budget.

Contractor:
Wesslen Construction, Inc,

Total Cost:	**$1,894,403**
RAP:	$266,574
Federal:	$1,624,991
County:	$2,838

Tables

Table A

COUNTY BRIDGE DATA - NOVEMBER 2018

Washington State Bridge Inventory System

Bridges 20 Feet or Greater in Length on Federal Aid (FAR) and Non Federal Aid (NFAR) Routes

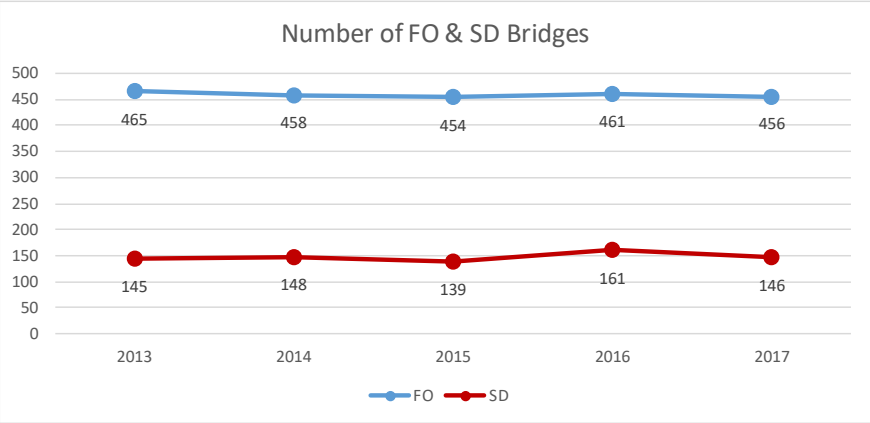
Posting Consideration Based on all AASHTO Legal Load Trucks

COUNTY	County Owned	Bridges Posted or May Consider Posting				Bridges With Posting Not Required				Deficient
	Bridges	FAR	Square Feet	NFAR	Square Feet	FAR	Square Feet	NFAR	Square Feet	Bridges*
ADAMS	111	11	23,869	0	0	56	110,546	44	45,131	11
ASOTIN	18	0	0	0	0	13	164,154	5	11,952	2
BENTON	50	1	1,390	1	1,222	23	77,350	25	26,735	9
CHELAN	53	3	19,038	4	3,123	27	131,222	19	53,348	11
CLALLAM	28	0	0	3	7,939	10	70,022	15	64,528	5
CLARK	55	0	0	1	569	27	112,840	27	53,136	14
COLUMBIA	63	9	15,919	6	5,721	25	46,584	23	37,655	9
COWLITZ	63	3	8,836	7	32,786	26	140,987	27	60,980	14
DOUGLAS	20	1	2,700	0	0	13	56,916	6	12,657	0
FERRY	22	0	0	3	5,935	7	11,708	12	23,487	6
FRANKLIN	85	11	13,821	17	20,418	28	58,073	29	43,704	11
GARFIELD	34	5	5,928	2	1,840	16	15,421	11	13,929	5
GRANT	195	13	35,456	14	19,666	87	226,571	81	118,915	16
GRAYS HARBOR	172	3	54,989	0	0	85	371,791	84	164,476	24
ISLAND	0	0	0	0	0	0	0	0	0	0
JEFFERSON	32	0	0	0	0	13	23,082	19	67,852	4
KING	130	2	5,529	8	14,646	80	530,153	40	111,528	55
KITSAP	39	0	0	0	0	22	88,509	17	23,767	2
KITTITAS	112	1	899	15	24,127	28	95,948	68	119,938	8
KLICKITAT	57	0	0	0	0	14	44,952	43	91,128	15
LEWIS	198	0	0	2	2,664	69	244,452	127	252,046	25
LINCOLN	123	5	5,191	19	15,861	39	69,733	60	103,183	14
MASON	53	0	0	1	9,386	10	44,917	42	111,949	13
OKANOGAN	49	0	0	6	4,880	12	59,992	31	73,211	5
PACIFIC	62	4	12,010	13	47,995	5	20,513	40	96,687	13
PEND OREILLE	28	1	1,020	2	1,440	13	119,195	12	15,442	5
PIERCE	101	4	56,114	3	5,563	64	287,813	30	54,444	37
SAN JUAN	4	0	0	0	0	1	636	3	4,022	2
SKAGIT	105	0	0	1	3,971	43	201,832	61	131,896	22
SKAMANIA	25	0	0	3	6,938	5	35,395	17	57,508	6
SNOHOMISH	167	6	15,412	7	21,202	95	591,635	59	186,828	43
SPOKANE	106	7	32,194	6	6,229	46	250,408	47	121,593	20
STEVENS	48	3	6,980	4	3,592	20	56,674	21	41,841	14
THURSTON	94	0	0	2	1,724	62	265,210	30	69,862	20
WAHKIAKUM	20	0	0	1	2,496	12	38,931	7	13,485	1
WALLA WALLA	106	7	25,201	12	11,383	33	110,109	54	124,931	11
WHATCOM	138	2	16,955	16	20,841	34	135,918	86	160,315	33
WHITMAN	250	20	27,618	19	21,722	103	224,729	108	146,509	55
YAKIMA	309	0	0	7	9,367	168	488,548	134	232,116	45
TOTAL	3,325	122	387,069	205	335,246	1,434	5,623,469	1,564	3,142,714	605

* Deficient Bridges are listed in WSBIS as Structurally Deficient (SD) or Functionally Obsolete (FO).

County Bridge Condition at a Glance

All County NBI Bridges as of December 12th, 2018		
Year	Deficiency Code	Count
2013	FO	465
2013	SD	145
2014	FO	458
2014	SD	148
2015	FO	454
2015	SD	139
2016	FO	461
2016	SD	161
2017	FO	456
2017	SD	146



All County NBI Bridges as of December 12th, 2018	
Year	Avgerage Sufficiency Rating
2013	82.05
2014	81.95
2015	82.31
2016	82.23
2017	82.79

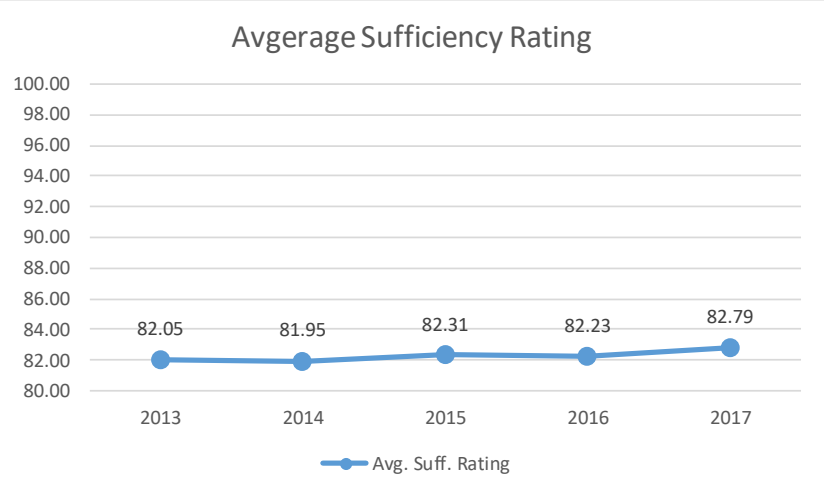


Table B

ACTUAL COUNTY ROAD RELATED REVENUES
2017
(thousands of dollars)

COUNTY	MOTOR VEHICLE FUEL TAX					TAXES				MISC			TOTAL
	COUNTY REGULAR	TIB	RAP	CAPP	MVFT TOTAL	PROP-ERTY	TIMBER EXCISE	OTHER TAXES	TOTAL TAXES	FED GRANTS	FED LANDS	OTHER	
ADAMS	4,306	0	11	734	5,051	1,745	0	0	1,745	2,544	1	361	9,702
ASOTIN	1,669	3,040	276	129	5,114	1,093	5	3	1,101	1,038	6	143	7,402
BENTON	3,374	0	140	377	3,892	5,778	0	146	5,924	88	0	1,209	11,113
CHELAN	2,421	248	2,205	304	5,179	7,602	26	48	7,676	1,259	94	404	14,612
CLALLAM	2,129	0	1,035	171	3,335	7,176	351	25	7,552	1,116	55	3,305	15,363
CLARK	7,329	3,161	113	579	11,181	34,068	135	24	34,227	3,958	5	20,595	69,966
COLUMBIA	1,513	0	994	180	2,687	1,401	0	3	1,404	487	17	145	4,740
COWLITZ	2,455	0	117	281	2,853	9,536	787	104	10,427	891	0	1,209	15,380
DOUGLAS	3,687	1,143	147	381	5,358	5,885	0	43	5,928	1,001	0	1,169	13,456
FERRY	1,823	0	1,291	374	3,489	799	63	1	863	737	148	178	5,415
FRANKLIN	2,976	0	31	435	3,442	2,678	0	33	2,711	1,579	141	481	8,354
GARFIELD	1,325	0	15	199	1,539	810	0	4	814	0	1,682	103	4,138
GRANT	6,640	0	1,780	1,059	9,479	9,238	0	215	9,453	3,717	475	20	23,144
GRAYS HARBOR	2,544	0	71	330	2,945	5,808	1,015	62	6,885	3,000	21	5,583	18,434
ISLAND	2,375	0	109	273	2,758	8,727	0	4	8,731	1,100	0	6,404	18,993
JEFFERSON	1,470	0	730	166	2,366	3,631	225	12	3,868	1,475	76	1,480	9,265
KING	13,422	0	689	598	14,709	87,591	177	46	87,814	4,750	83	41,534	148,890
KITSAP	5,363	1,280	1,314	395	8,352	24,839	55	50	24,944	4,691	0	5,025	43,012
KITTITAS	2,081	0	96	1,021	3,198	4,046	1	12	4,059	1,220	0	1,188	9,665
KLICKITAT	2,785	0	639	464	3,888	4,459	342	38	4,839	3,304	66	1,953	14,050
LEWIS	3,424	0	517	364	4,306	11,662	1,254	13	12,929	4,360	161	2,835	24,591
LINCOLN	4,480	0	62	571	5,114	2,047	0	10	2,057	2,391	7	384	9,953
MASON	2,368	0	803	339	3,509	8,151	0	0	8,151	1,904	18	1,181	14,763
OKANOGAN	3,489	0	860	531	4,880	3,724	34	16	3,774	0	1,894	195	10,743
PACIFIC	1,437	0	941	423	2,802	3,175	347	14	3,536	873	0	508	7,719
PEND OREILLE	1,714	0	28	263	2,005	1,820	147	5	1,972	123	75	292	4,467
PIERCE	10,773	541	1,436	900	13,650	55,516	207	7,147	62,870	5,807	30	15,798	98,155
SAN JUAN	891	0	126	110	1,128	3,949	1	6	3,956	870	0	4,401	10,355
SKAGIT	3,535	0	0	453	3,988	13,334	439	71	13,844	6,936	37	4,290	29,095
SKAMANIA	866	0	0	1,315	2,181	1,766	235	11	2,012	464	2	192	4,851
SNOHOMISH	9,655	605	671	643	11,574	62,071	274	654	62,999	10,456	0	20,137	105,166
SPOKANE	9,219	862	978	939	11,998	22,712	69	16	22,797	3,500	9	4,001	42,305
STEVENS	3,851	0	30	595	4,475	5,346	0	0	5,346	393	15	828	11,057
THURSTON	5,382	48	22	439	5,891	19,050	253	27	19,330	2,591	0	5,125	32,937
WAHKIAKUM	890	0	38	273	1,200	123	40	0	163	235	1	730	2,329
WALLA WALLA	3,051	0	21	527	3,599	5,395	6	86	5,487	143	1	882	10,112
WHATCOM	4,279	0	0	665	4,944	18,833	165	37	19,035	669	79	2,439	27,166
WHITMAN	4,375	0	841	531	5,747	2,436	0	39	2,475	550	0	344	9,116
YAKIMA	6,771	572	204	933	8,479	12,336	4	45	12,385	5,715	117	2,814	29,510
TOTALS	152,137	11,500	19,384	19,265	202,286	480,356	6,657	9,070	496,083	85,935	5,316	159,865	949,485
% OF TOTAL	16.0%	1.2%	2.0%	2.0%	21.3%	50.6%	0.7%	1.0%	52.2%	9.1%	0.6%	16.8%	

Source: County Reports to D.O.T. Secretary of Transportation

Table C

ACTUAL COUNTY ROAD RELATED EXPENDITURES

Including RAP and CAPP

2017

(thousands of dollars)

COUNTY	CONST	MAINT	ADMIN & OPER	FACIL	FERRY	BOND WARRANT RET'T	TRAFFIC POLICING **	OTHER	TOTAL INCLUDES RAP & CAPP	RAP	CAPP ***
ADAMS	2,532	5,003	1,406	0	0	0	75	686	9,702	11	734
ASOTIN	4,842	2,228	801	0	0	0	0	0	7,871	276	129
BENTON	470	8,437	1,882	167	0	206	0 *	69	11,231	140	377
CHELAN	4,476	6,897	2,599	16	0	0	0	378	14,366	2,205	304
CLALLAM	5,226	8,377	3,109	10	0	0	800	133	17,655	1,035	0
CLARK	31,009	18,902	21,054	80	0	0	6 *	0	71,051	113	579
COLUMBIA	2,351	2,365	522	0	0	0	0 *	0	5,238	994	180
COWLITZ	1,702	7,449	3,130	76	0	70	0	443	12,870	117	281
DOUGLAS	3,325	5,724	2,810	52	0	531	0	707	13,149	147	381
FERRY	1,540	2,389	634	0	0	0	0 *	485	5,048	1,291	152
FRANKLIN	606	4,094	1,306	78	0	253	473	2,317	9,127	31	396
GARFIELD	2,148	1,684	162	0	0	0	0	58	4,052	15	199
GRANT	7,727	8,830	5,917	158	0	0	204	693	23,529	1,780	1,059
GRAYS HARBOR	5,139	8,904	1,819	20	0	0	0	21	15,903	71	330
ISLAND	8,093	5,870	5,971	0	0	0	0	206	20,140	109	273
JEFFERSON	2,866	4,579	1,426	168	0	47	0 *	466	9,552	730	166
KING	1,612	79,515	38,825	2,812	0	5,866	6,303	9,939	144,872	689	598
KITSAP	13,323	14,239	11,531	211	0	48	0 *	4,898	44,250	1,314	395
KITTITAS	3,531	6,191	1,738	161	0	0	0 *	29	11,650	96	1,021
KLICKITAT	7,035	5,067	1,331	0	0	0	0	319	13,752	639	464
LEWIS	9,351	13,374	4,130	1	0	7	1,310	541	28,714	517	364
LINCOLN	2,288	5,355	1,221	7	0	0	0 *	406	9,277	62	342
MASON	4,439	6,785	2,937	149	0	910	0 *	0	15,220	803	339
OKANOGAN	2,514	7,532	1,780	9	0	44	0	0	11,879	860	531
PACIFIC	2,632	3,892	1,131	10	0	0	311	0	7,976	941	3
PEND OREILLE	252	2,674	659	0	0	0	161	868	4,614	28	263
PIERCE	10,723	39,220	26,555	1,782	4,804	6,852	2,704	1,231	93,871	1,436	900
SAN JUAN	2,743	4,134	1,441	231	0	0	0 *	1	8,550	126	110
SKAGIT	11,026	9,554	5,632	166	3,053	0	0 *	297	29,728	0	453
SKAMANIA	962	1,971	547	128	0	0	0	11	3,619	0	135
SNOHOMISH	21,951	31,685	28,974	238	0	418	0	19,557	102,823	671	643
SPOKANE	6,856	23,426	9,832	4,831	0	1,956	72 *	327	47,300	978	939
STEVENS	955	7,559	983	9	0	0	0	51	9,557	30	595
THURSTON	6,516	13,311	8,730	2,490	0	0	112 *	32	31,191	22	439
WAHKIAKUM	159	794	344	0	635	0	0	25	1,957	38	47
WALLA WALLA	2,808	4,625	2,265	0	0	0	0	126	9,824	21	527
WHATCOM	7,158	13,885	6,319	93	2,799	0	0 *	672	30,926	0	665
WHITMAN	2,739	5,793	1,381	0	0	0	122	0	10,035	841	531
YAKIMA	14,866	10,853	3,612	7	0	1,080	448	215	31,081	204	933
TOTALS	220,491	413,166	216,446	14,160	11,291	18,288	13,101	46,207	953,150	19,384	16,776
% OF TOTAL	23.1%	43.3%	22.7%	1.5%	1.2%	1.9%	1.4%	4.8%			

Construction expenditure amounts do not include State ad & award Federal Aid participation
Source: County Reports to D.O.T. Secretary of Transportation
* Traffic Policing funds paid from diverted road levy
** Road Fund portion only
*** includes $5 Million Motor Vehicle Account Funds

Table D

ANTICIPATED COUNTY ROAD FUND REVENUES 2018 BUDGETS

(thousands of dollars)

COUNTY	BEGIN FUND BAL	MOTOR VEHICLE FUEL TAX					TAXES			MISC			TOTAL
		COUNTY REGULAR	TIB	RAP	CAPP	OTHER STATE	PROP-ERTY	TIMBER EXCISE	OTHER TAXES	FED GRANTS	FED LANDS	OTHER	
ADAMS	4,800	4,244	0	257	809	14	1,756	0	8	889	1	65	12,843
ASOTIN	1,211	1,657	0	800	169	104	1,159	5	8	20	10	11	5,154
BENTON	6,900	3,300	0	2,500	509	71	5,771	0	115	1,868	0	4,197	25,231
CHELAN	2,223	2,264	13	819	306	1,898	7,373	5	25	926	4	813	16,669
CLALLAM	12,417	2,000	0	453	210	354	7,201	319	26	1,489	0	1,406	25,875
CLARK	14,848	6,325	9,405	170	756	0	32,502	400	20	5,167	3	37,182	106,778
COLUMBIA	540	1,400	0	1,231	210	40	1,496	1	3	129	0	49	5,099
COWLITZ	8,974	2,174	0	340	310	0	9,501	650	85	1,206	0	300	23,540
DOUGLAS	4,812	3,646	199	1,237	445	0	6,084	0	380	1,684	0	1,784	20,271
FERRY	300	1,788	0	796	264	2	810	35	1	2,460	30	122	6,608
FRANKLIN	808	2,889	0	352	507	264	2,700	0	35	4,726	171	645	13,097
GARFIELD	1,042	1,413	0	90	183	0	755	0	3	479	0	80	4,045
GRANT	6,700	6,550	0	995	1,234	16	8,800	0	140	3,250	209	196	28,090
GRAYS HARBOR	5,242	2,389	0	908	386	379	5,692	800	30	6,676	152	796	23,450
ISLAND	18,523	2,275	0	0	456	5,293	8,758	3	0	602	24	996	36,930
JEFFERSON	4,861	1,434	0	170	178	1,860	4,423	125	8	91	66	203	13,419
KING	13,640	12,100	0	0	600	7,580	89,354	0	5,025	10,370	85	38,699	177,453
KITSAP	35,650	5,550	25	100	533	76	28,394	0	210	389	0	6,084	77,011
KITTITAS	10,163	2,085	0	880	500	61	4,000	0	0	3,016	40	597	21,342
KLICKITAT	50	2,700	0	70	540	2	4,300	0	15	1,713	9	1,072	10,471
LEWIS	5,825	3,350	14	563	425	942	11,200	1,400	18	2,213	0	1,514	27,464
LINCOLN	1,000	4,755	0	1,593	570	62	1,551	0	10	3,581	6	312	13,440
MASON	7,522	2,200	0	1,035	400	20	7,669	160	10	1,128	15	631	20,790
OKANOGAN	3,600	3,390	0	135	621	70	4,091	50	20	7,017	754	219	19,967
PACIFIC	2,500	1,340	0	550	238	0	3,083	400	10	752	25	129	9,027
PEND OREILLE	650	1,680	0	2,290	192	285	1,980	100	1	3,344	115	172	10,809
PIERCE	42,001	11,081	1,201	476	1,200	2,639	56,918	240	30	9,090	250	24,418	149,544
SAN JUAN	1,979	884	0	1,671	144	2,776	4,095	1	5	0	0	956	12,511
SKAGIT	7,372	3,139	0	1,076	528	1,289	14,817	300	50	12,682	0	2,170	43,423
SKAMANIA	1,806	864	0	0	152	646	1,777	210	5	808	2	779	7,049
SNOHOMISH	28,191	9,582	1,999	35	850	1,300	62,525	327	480	6,530	52	33,152	145,023
SPOKANE	11,819	9,678	333	4,635	1,098	548	24,542	30	25	14,269	7	3,170	70,154
STEVENS	7,500	3,600	0	0	690	101	5,218	250	3	2,794	15	107	20,278
THURSTON	13,480	5,233	1,736	1,623	579	115	19,750	240	0	3,478	1	8,809	55,044
WAHKIAKUM	1,421	894	0	555	289	500	143	30	1	958	1	227	5,019
WALLA WALLA	5,800	3,020	0	100	600	375	5,387	0	75	7,061	0	274	22,692
WHATCOM	30,350	4,235	0	0	610	281	18,234	219	38	4,036	564	5,841	64,408
WHITMAN	6,789	4,391	0	2,540	500	71	2,160	0	30	2,755	0	8	19,244
YAKIMA	4,260	6,099	146	3,779	1,089	0	12,291	0	0	1,442	235	1,693	31,034
TOTAL	337,569	147,598	15,071	34,824	19,880	30,034	488,260	6,300	6,948	131,088	2,846	179,878	1,400,296
% OF TOTAL	24.1%	10.5%	1.1%	2.5%	1.4%	2.1%	34.9%	0.4%	0.5%	9.4%	0.2%	12.8%	

Table E

ANTICIPATED COUNTY ROAD FUND EXPENDITURES 2018 BUDGETS

(thousands of dollars)

COUNTY	CONST	MAINT	ADMIN & OPER	FACIL	FERRY	BOND WARR RET'T	TRAFFIC POLICING	OTHER	TOTAL	END FUND BAL	GRAND TOTAL
ADAMS	2,332	5,337	1,257	250	0	0	0	166	9,342	3,501	12,843
ASOTIN	838	2,290	671	0	0	0	0	0	3,799	1,355	5,154
BENTON	11,822	8,109	2,400	0	0	206	0	128	22,665	2,566	25,231
CHELAN	4,722	7,817	2,430	0	0	0	0	415	15,384	1,285	16,669
CLALLAM	6,989	8,009	3,102	100	0	0	810	198	19,208	6,667	25,875
CLARK	52,822	21,944	20,191	491	0	0	5	4,830	100,283	6,495	106,778
COLUMBIA	1,507	2,236	627	0	0	132	0	50	4,552	547	5,099
COWLITZ	3,430	9,721	3,874	533	0	72	0	472	18,102	5,438	23,540
DOUGLAS	5,530	6,888	3,334	54	0	534	0	862	17,202	3,069	20,271
FERRY	2,783	2,500	407	0	0	0	0	119	5,809	799	6,608
FRANKLIN	4,477	5,045	1,335	0	0	252	473	847	12,429	668	13,097
GARFIELD	820	1,780	374	0	0	0	0	68	3,042	1,003	4,045
GRANT	6,800	13,372	1,862	0	0	2	270	745	23,051	5,039	28,090
GRAYS HARBOR	9,715	8,106	1,746	106	0	0	697	9	20,379	3,071	23,450
ISLAND	10,209	7,928	3,328	588	0	0	825	1,760	24,638	12,292	36,930
JEFFERSON	2,540	4,710	1,508	0	0	78	720	2	9,558	3,861	13,419
KING	7	78,263	35,066	17	0	5,841	6,250	42,052	167,496	9,957	177,453
KITSAP	19,732	18,599	10,749	384	0	49	2,901	4,293	56,707	20,304	77,011
KITTITAS	5,305	6,045	1,805	65	0	0	0	440	13,660	7,682	21,342
KLICKITAT	3,813	5,400	1,100	0	0	0	0	20	10,333	138	10,471
LEWIS	2,405	15,631	4,704	0	0	0	0	1,595	24,335	3,129	27,464
LINCOLN	5,906	4,500	1,241	0	0	0	0	439	12,086	1,354	13,440
MASON	4,259	7,760	3,377	265	0	0	0	1,131	16,792	3,998	20,790
OKANOGAN	6,798	7,357	2,306	40	0	0	0	5	16,506	3,461	19,967
PACIFIC	2,197	4,464	1,304	0	0	0	330	0	8,295	732	9,027
PEND OREILLE	5,883	3,660	924	40	0	0	0	52	10,559	250	10,809
PIERCE	24,090	25,061	47,059	0	1,550	3,455	0	31,097	132,312	17,232	149,544
SAN JUAN	4,524	4,542	1,594	130	0	0	0	703	11,493	1,018	12,511
SKAGIT	12,783	0	15,216	0	2,603	0	1,350	4,946	36,898	6,525	43,423
SKAMANIA	2,122	2,443	784	220	0	0	0	1	5,570	1,479	7,049
SNOHOMISH	31,820	30,976	31,267	176	0	418	0	30,420	125,077	19,946	145,023
SPOKANE	20,246	22,706	12,358	4,508	0	2,050	77	497	62,442	7,712	70,154
STEVENS	3,765	8,581	1,060	3,500	0	0	0	49	16,955	3,323	20,278
THURSTON	14,974	16,044	10,866	2,105	0	0	142	1,796	45,927	9,117	55,044
WAHKIAKUM	2,752	586	214	0	934	0	0	33	4,519	500	5,019
WALLA WALLA	10,862	5,479	2,423	0	0	0	0	190	18,954	3,738	22,692
WHATCOM	11,194	14,278	7,649	6,715	2,660	0	0	4,021	46,517	17,891	64,408
WHITMAN	9,886	6,879	1,195	732	0	0	121	221	19,034	210	19,244
YAKIMA	11,997	12,195	4,176	0	0	1,070	512	0	29,950	1,084	31,034
TOTAL	344,656	417,241	246,883	21,019	7,747	14,159	15,483	134,672	1,201,860	198,436	1,400,296
% OF TOTAL	24.6%	29.8%	17.6%	1.5%	0.6%	1.0%	1.1%	9.6%	85.8%	14.2%	

Table F

COUNTY ROAD LEVY SUMMARY

As shown in 2018 Budgets

(thousands of dollars)

COUNTY	Unincorp Valuation	County Road Maximum Property Tax Levy (2.25)	County Road Property Tax Revenue Planned	Operating Transfer	Payment for Services	(RCW 36.33.220) Diversion from Road To Current Expense	(RCW 36.33.220) County Road Property Tax Exp. for Other Purposes		Revenue Remaining in Road Fund	Levy Shift from Road to Current Exp. (RCW 84.52.043)
				Traffic Policing expense paid by:						
ADAMS	1,376,089	3,096	1,790						1,790	0
ASOTIN	1,178,900	2,653	1,134						1,134	600
BENTON	4,233,673	9,526	6,493			576			5,916	0
CHELAN	6,253,523	14,070	7,750	220					7,530	500
CLALLAM	5,523,065	12,427	7,281		810				6,471	0
CLARK	26,445,839	59,503	39,925			4,533			35,392	0
COLUMBIA	757,722	1,705	1,611				Divert - Cur Exp/Solid Waste	115	1,496	0
COWLITZ	5,909,356	13,296	9,500						9,500	2,500
DOUGLAS	3,973,422	8,940	6,184						6,184	0
FERRY	581,170	1,308	1,307			458			850	0
FRANKLIN	2,626,166	5,909	2,774		473				2,301	650
GARFIELD	562,496	1,266	755						755	80
GRANT	5,326,966	11,986	9,434		270				9,164	0
GRAYS HARBOR	2,718,253	6,116	5,946		550				5,396	0
ISLAND	11,436,110	25,731	8,799	825					7,974	0
JEFFERSON	3,582,799	8,061	4,444			720			3,724	0
KING	43,501,122	97,878	89,834	7,500					82,334	0
KITSAP	20,297,390	45,669	28,402	3,102					25,300	0
KITTITAS	4,501,292	10,128	4,378			200			4,178	889
KLICKITAT	2,842,451	6,396	4,550						4,550	0
LEWIS	5,461,634	12,289	11,072	1,407					11,072	800
LINCOLN	1,221,068	2,747	2,127			500			1,627	0
MASON	6,904,789	15,536	10,721			2,160			8,561	0
OKANOGAN	2,959,852	6,660	4,091						4,091	600
PACIFIC	1,899,006	4,273	3,004		339				2,665	200
PEND OREILLE	1,261,989	2,839	1,834						1,834	200
PIERCE	43,582,811	98,061	70,736	2,868			Divert - Traffic and Courts	13,850 *	54,018	0
SAN JUAN	6,478,312	14,576	4,621			650			3,971	0
SKAGIT	8,595,846	19,341	15,073			1,350			13,723	0
SKAMANIA	1,279,821	2,880	1,829						1,829	0
SNOHOMISH	49,924,122	112,329	64,022	4,204					59,817	0
SPOKANE	15,484,627	34,840	24,763						24,763	4,500
STEVENS	3,382,676	7,611	5,412						5,412	500
THURSTON	15,400,042	34,650	21,001		142	1,500			19,359	1,500
WAHKIAKUM	405,689	913	125						125	447
WALLA WALLA	2,764,609	6,220	5,543						5,543	0
WHATCOM	13,814,750	31,083	19,896			807			19,089	0
WHITMAN	1,773,831	3,991	2,527		121				2,407	0
YAKIMA	7,049,030	15,860	12,693	448					12,693	2,200
TOTALS	343,272,306	772,363	523,382	20,575	2,704	13,453		13,965	474,540	16,167

* Increased by voter approval (RCW 84.55.050)

Table G

COUNTY ROAD MILEAGE - 1/1/18

COUNTY	URBAN ROADS			RURAL ROADS			SYSTEM CENTERLINE TOTAL	PAVED ARTERIAL C/L MILES	PAVED ARTERIAL LANE-MILES	UNPAVED C/L MILES
	ACCESS	ARTERIAL	TOTAL	ACCESS	ARTERIAL	TOTAL				
ADAMS	10.76	3.73	14.49	1,093.86	665.82	1,759.67	1,774.16	547.50	1,091.78	1,124.92
ASOTIN	59.52	20.82	80.34	167.08	152.33	319.41	399.75	100.55	203.36	231.96
BENTON	126.47	50.51	176.98	393.23	290.07	683.30	860.28	295.29	590.57	253.13
CHELAN	54.19	25.91	80.10	357.04	209.87	566.91	647.00	235.50	471.64	123.33
CLALLAM	83.01	15.09	98.10	270.27	120.29	390.56	488.66	135.19	269.74	3.15
CLARK	414.19	142.44	556.63	279.25	272.70	551.95	1,108.58	415.14	890.13	12.80
COLUMBIA	0.00	0.00	0.00	271.68	229.10	500.78	500.78	141.34	282.69	354.10
COWLITZ	46.32	25.57	71.89	259.61	195.69	455.30	527.19	221.26	442.57	6.56
DOUGLAS	62.27	38.15	100.42	1,145.99	400.39	1,546.38	1,646.80	296.99	600.75	1,205.56
FERRY	0.00	0.00	0.00	504.30	232.32	736.62	736.62	177.63	355.63	535.10
FRANKLIN	19.80	11.28	31.09	610.41	336.93	947.34	978.43	342.88	684.29	393.57
GARFIELD	0.00	0.00	0.00	234.05	213.03	447.07	447.07	126.18	252.35	315.15
GRANT	62.78	30.87	93.65	1,537.01	871.87	2,408.88	2,502.53	828.16	1,663.97	1,026.77
GRAYS HARBOR	32.91	21.44	54.35	264.71	242.22	506.93	561.27	259.05	518.06	35.81
ISLAND	96.13	35.02	131.15	272.27	179.93	452.20	583.35	214.94	430.61	5.06
JEFFERSON	5.14	0.00	5.14	255.67	138.48	394.15	399.29	130.34	261.30	73.06
KING	631.18	207.79	838.98	388.19	242.26	630.45	1,469.43	450.05	939.46	51.03
KITSAP	412.15	167.38	579.53	195.36	140.06	335.41	914.94	307.44	622.31	4.52
KITTITAS	10.79	12.00	22.79	242.14	296.38	538.52	561.30	304.56	613.86	63.31
KLICKITAT	0.00	0.00	0.00	695.63	384.49	1,080.12	1,080.12	366.05	731.24	516.46
LEWIS	35.54	22.44	57.98	718.06	266.14	984.19	1,042.17	286.54	573.80	41.68
LINCOLN	0.00	0.00	0.00	1,338.44	658.52	1,996.96	1,996.96	386.72	773.45	1,538.54
MASON	27.75	9.56	37.31	316.06	263.21	579.27	616.57	263.17	526.27	44.78
OKANOGAN	7.13	2.80	9.93	834.97	490.62	1,325.59	1,335.52	418.60	837.20	657.51
PACIFIC	0.00	0.00	0.00	215.59	130.31	345.89	345.89	120.01	240.40	44.75
PEND OREILLE	0.00	0.00	0.00	380.41	180.86	561.27	561.27	167.49	334.98	265.61
PIERCE	633.79	428.64	1,062.43	248.80	250.77	499.57	1,562.00	679.41	1,439.07	13.05
SAN JUAN	0.00	0.00	0.00	184.05	86.80	270.85	270.85	86.80	173.60	39.99
SKAGIT	71.73	36.91	108.64	373.53	319.04	692.57	801.21	355.95	712.79	40.16
SKAMANIA	0.00	0.00	0.00	148.93	90.45	239.38	239.38	90.45	181.37	28.75
SNOHOMISH	630.37	187.74	818.11	445.94	330.38	776.32	1,594.43	515.12	1,057.14	10.98
SPOKANE	290.57	127.59	418.16	1,446.36	663.05	2,109.41	2,527.57	720.07	1,477.62	1,131.34
STEVENS	0.00	0.00	0.00	929.06	560.61	1,489.67	1,489.67	468.41	936.84	823.36
THURSTON	334.36	112.43	446.80	350.85	232.14	582.99	1,029.79	344.57	702.69	21.55
WAHKIAKUM	0.00	0.00	0.00	56.49	81.82	138.31	138.31	78.31	156.62	12.65
WALLA WALLA	42.32	34.58	76.90	452.58	423.46	876.04	952.95	413.08	826.32	364.58
WHATCOM	124.50	69.98	194.48	455.79	288.30	744.09	938.57	358.28	719.40	30.82
WHITMAN	0.00	0.00	0.00	1,281.62	613.99	1,895.61	1,895.61	420.52	841.04	1,453.73
YAKIMA	121.58	101.60	223.18	773.75	646.63	1,420.38	1,643.56	726.39	1,468.40	538.82
STATEWIDE	4,447.23	1,942.26	6,389.49	20,389.01	12,391.28	32,780.29	39,169.79	12,795.90	25,895.30	13,437.96
EASTERN	868.17	459.84	1,328.01	14,689.60	8,520.32	23,209.92	24,537.93	7,483.89	15,037.98	12,916.81
WESTERN	3,579.06	1,482.42	5,061.48	5,699.41	3,870.97	9,570.38	14,631.86	5,312.01	10,857.32	521.14

County Road Log Data certified 1/1/2018 by the County Road Administration Board

Table H

COUNTY ARTERIAL PRESERVATION PROGRAM

2017 ACCOMPLISHMENT SUMMARY

COUNTY	1/1/16 Eligible Arterial System C/Line (miles)	Total CAPP * Rec'd ($1,000)	Total CAPP * Expended ($1,000)	Total Eligible Expenses ($1,000)	CAPP * Contri-bution (%)	2017 Arterial Prep/ Repair ($1,000)	2017 Arterial Sealcoat C/Line (miles)	2017 Arterial Overlay C/Line (miles)	2017 Total Resurf. C/Line (miles)	2017 Percent System Resurf'd
ADAMS	547.56	733.9	733.9	1,307.1	56.1	111.9	70.8	0.0	70.8	12.9
ASOTIN	100.30	129.1	129.1	211.9	60.9	0.0	15.1	0.0	15.1	15.1
BENTON	297.21	377.5	377.5	1,138.7	33.2	0.0	65.6	0.0	65.6	22.1
CHELAN	239.23	304.5	304.5	1,801.3	16.9	618.5	13.9	1.5	15.3	6.4
CLALLAM	135.33	170.7	0.0	2,251.2	0.0	1,188.8	53.7	0.0	53.7	39.7
CLARK	422.77	578.5	578.5	6,648.8	8.7	1,061.1	18.3	9.2	27.4	6.5
COLUMBIA	141.41	179.8	179.8	430.6	41.8	199.1	16.7	0.0	16.7	11.8
COWLITZ	221.31	281.1	281.1	1,234.2	22.8	457.6	31.1	2.1	33.1	15.0
DOUGLAS	296.49	380.6	380.6	846.3	45.0	827.6	0.6	0.0	0.6	0.2
FERRY	177.63	374.1	151.5	152.0	99.7	152.0	0.0	0.0	0.0	0.0
FRANKLIN	343.33	435.5	396.3	396.3	100.0	46.2	18.0	0.0	18.0	5.2
GARFIELD	123.58	199.1	199.1	624.3	31.9	55.7	25.1	0.0	25.1	20.3
GRANT	829.97	1059.0	1059.0	6,494.0	16.3	1,187.3	109.2	8.2	117.4	14.1
GRAYS HARBOR	259.64	329.7	329.7	1,776.3	18.6	903.8	27.7	0.0	27.7	10.7
ISLAND	214.94	273.4	273.4	798.4	34.2	0.0	0.0	4.5	4.5	2.1
JEFFERSON	130.34	165.9	165.9	805.7	20.6	106.8	7.7	2.3	9.9	7.6
KING	450.06	598.0	598.0	15,201.6	3.9	5,560.6	17.4	26.4	43.9	9.7
KITSAP	307.72	394.9	394.9	1,339.5	29.5	604.8	1.1	6.8	7.9	2.6
KITTITAS	304.56	1021.1	1021.1	1,065.8	95.8	0.0	41.0	0.0	41.0	13.4
KLICKITAT	366.05	464.2	464.2	1,183.2	39.2	0.0	12.2	6.3	18.5	5.0
LEWIS	286.74	364.3	364.3	1,931.2	18.9	199.1	38.2	2.6	40.8	14.2
LINCOLN	384.74	571.2	341.6	368.1	92.8	368.1	0.0	0.0	0.0	0.0
MASON	267.13	338.7	338.7	2,187.1	15.5	223.1	19.9	7.0	26.9	10.1
OKANOGAN	418.53	531.5	531.5	1,830.0	29.0	539.9	74.0	0.0	74.0	17.7
PACIFIC	120.01	423.3	2.9	999.4	0.3	451.5	0.0	5.2	5.2	4.4
PEND OREILLE	167.49	263.0	263.0	294.1	89.4	0.0	13.1	0.0	13.1	7.8
PIERCE	670.38	899.7	899.7	5,919.6	15.2	1,053.0	26.8	11.6	38.4	5.7
SAN JUAN	86.80	110.3	110.3	593.7	18.6	409.9	5.7	0.0	5.7	6.5
SKAGIT	355.96	452.7	452.7	1,851.0	24.5	298.2	37.6	3.2	40.8	11.5
SKAMANIA	90.45	1,315.4	135.0	283.7	47.6	119.6	5.1	0.0	5.1	5.7
SNOHOMISH	492.61	643.3	643.3	2,390.1	26.9	859.5	18.3	5.8	24.1	4.9
SPOKANE	719.38	938.9	938.9	4,491.8	20.9	1,719.0	72.2	3.7	75.9	10.6
STEVENS	468.41	594.9	594.9	1,054.8	56.4	500.3	41.7	0.0	41.7	8.9
THURSTON	337.40	438.8	438.8	2,433.8	18.0	892.2	30.7	2.4	33.1	9.8
WAHKIAKUM	78.31	272.8	46.6	46.6	100.0	46.6	0.0	0.0	0.0	0.0
WALLA WALLA	414.47	526.9	526.9	1,180.2	44.6	320.0	54.9	0.0	54.9	13.2
WHATCOM	358.28	664.8	664.8	1,592.1	41.8	725.8	35.9	0.0	35.9	10.0
WHITMAN	418.35	531.3	531.3	1,991.7	26.7	590.1	20.7	4.8	25.6	6.1
YAKIMA	726.66	932.6	932.6	1,535.4	60.7	448.1	51.5	0.0	51.5	7.1
TOTAL	12,771.5	19,264.9	16,775.7	78,681.7	21.3%	22,845.8	1,091.3	113.5	1,204.8	
									% System Resurfaced:	9.4%

* Includes $1,015,750 statewide Connecting Washington funds for County Arterial Preservation and carried forward CAPA mounts from prior years.

Table I

COUNTY FREIGHT AND GOODS SYSTEM - 1/1/2018

COUNTY	Freight and Goods System - Truck Route Class					Total	Total	%
	T-1	T-2	T-3	T-4	T-5	FGTS	Adequate	Adequate
ADAMS			149.17	205.24	295.35	649.76	252.04	38.8%
ASOTIN		0.15	22.95	20.27		43.37	37.91	87.4%
BENTON			253.26	112.09	35.98	401.33	168.59	42.0%
CHELAN			48.40	91.71	42.02	182.13	58.22	32.0%
CLALLAM			73.03	61.55	11.01	145.59	3.75	2.6%
CLARK	0.22	9.76	133.56	159.90		303.44	249.24	82.1%
COLUMBIA			10.30	49.06	146.78	206.14	11.20	5.4%
COWLITZ			77.72	57.12	3.00	137.84	110.12	79.9%
DOUGLAS			8.04	84.58	171.15	263.77	15.31	5.8%
FERRY			109.25	115.71		224.96	10.66	4.7%
FRANKLIN			111.39	154.05	252.51	517.95	247.76	47.8%
GARFIELD				10.13	125.75	135.88	113.03	83.2%
GRANT		10.19	269.43	258.69	305.35	843.66	57.72	6.8%
GRAYS HARBOR			210.91	7.12		218.03	191.43	87.8%
ISLAND			13.21	57.29	0.20	70.69	69.54	98.4%
JEFFERSON			36.87	35.78	65.75	138.40	108.06	78.1%
KING	0.70	36.41	273.19	92.69		402.99	368.20	91.4%
KITSAP		2.39	220.68	98.86		321.93	231.72	72.0%
KITTITAS		3.78	135.46	173.80	0.08	313.13	237.45	75.8%
KLICKITAT			174.68	112.34		287.02	7.63	2.7%
LEWIS		1.98	124.93	261.60	102.44	490.96	270.67	55.1%
LINCOLN			165.13	259.35	377.27	801.75	466.41	58.2%
MASON		0.20	104.35	85.79		190.34	54.82	28.8%
OKANOGAN			100.51	117.32	181.68	399.51	6.29	1.6%
PACIFIC				136.49		136.49	27.97	20.5%
PEND OREILLE			38.39	125.40	62.21	226.00	0.49	0.2%
PIERCE	5.68	52.62	316.27	29.71	7.70	411.98	382.90	92.9%
SAN JUAN			23.92	64.33		88.25	56.78	64.3%
SKAGIT		4.48	145.98	89.93		240.40	110.50	46.0%
SKAMANIA			22.47	58.73		81.20	80.78	99.5%
SNOHOMISH	4.31	8.19	328.16	107.08	60.70	508.43	313.32	61.6%
SPOKANE	5.70	25.86	453.72	106.90	109.26	701.44	397.90	56.7%
STEVENS			91.82	164.52	78.95	335.29	12.82	3.8%
THURSTON		11.64	242.95	119.08	4.13	377.81	28.20	7.5%
WAHKIAKUM			17.12	39.66	5.30	62.08	45.36	73.1%
WALLA WALLA		1.89	114.03	301.51	5.39	422.81	46.04	10.9%
WHATCOM		6.36	166.30	26.73		199.39	70.40	35.3%
WHITMAN			200.15	193.68	86.73	480.56	204.32	42.5%
YAKIMA		7.43	375.36	235.95	55.80	674.54	664.60	98.5%
TOTAL	16.61	183.34	5,363.05	4,481.71	2,592.50	12,637.20	5,790.12	45.8%

County Road Log Data Certified 1/1/2018 by the County Road Administration Board

Table J

2017 COUNTY FORCES SUMMARY

COUNTY	2017 County Forces Limit	2017 Proposed County Forces Construction Expenditure	2017 Actual County Forces Construction Expenditure	% Expended of County Forces Limit
ADAMS	823,007	0	0	0.0%
ASOTIN	808,918	75,000	0	0.0%
BENTON	1,789,622	0	0	0.0%
CHELAN	1,270,104	77,000	0	0.0%
CLALLAM	1,267,265	367,000	106,882	8.4%
CLARK	3,391,047	346,000	403,179	11.9%
COLUMBIA	808,047	481,916	144,104	17.8%
COWLITZ	1,269,134	0	17,206	1.4%
DOUGLAS	1,281,694	1,000,000	278,765	21.7%
FERRY	809,690	620,239	296,656	36.6%
FRANKLIN	1,274,727	15,000	0	0.0%
GARFIELD	807,079	167,000	266,412	33.0%
GRANT	1,305,169	816,000	695,474	53.3%
GRAYS HARBOR	1,271,082	150,000	0	0.0%
ISLAND	1,269,721	440,000	123,177	9.7%
JEFFERSON	1,262,214	0	7,726	0.6%
KING	3,527,010	10,000	0	0.0%
KITSAP	1,814,064	810,000	714,559	39.4%
KITTITAS	1,267,294	200,000	138,064	10.9%
KLICKITAT	814,762	564,000	0	0.0%
LEWIS	1,278,241	1,025,000	438,639	34.3%
LINCOLN	823,821	650,000	93,208	11.3%
MASON	1,269,769	140,000	0	0.0%
OKANOGAN	1,279,129	234,997	893,714	69.9%
PACIFIC	807,345	200,000	47,812	5.9%
PEND OREILLE	809,160	0	9,579	1.2%
PIERCE	3,489,912	275,000	138,286	4.0%
SAN JUAN	804,783	360,000	236,918	29.4%
SKAGIT	1,278,117	30,000	9,288	0.7%
SKAMANIA	804,513	0	0	0.0%
SNOHOMISH	3,457,870	2,537,000	385,388	11.1%
SPOKANE	3,448,113	121,500	129,691	3.8%
STEVENS	1,282,159	1,000,000	423,683	33.0%
THURSTON	1,812,599	707,350	174,373	9.6%
WAHKIAKUM	804,732	431,240	47,290	5.9%
WALLA WALLA	1,275,345	100,000	360,897	28.3%
WHATCOM	1,799,773	1,170,000	104,868	5.8%
WHITMAN	1,286,529	803,000	277,032	21.5%
YAKIMA	1,822,959	75,000	0	0.0%
TOTAL	57,766,519	15,999,242	6,962,870	12.1%

Pavement Management

Whether the public is taking trips by automobiles, wheeled all-terrain vehicles, bicycle, transit, or walking, the benefits of maintaining roads in a safe and serviceable condition are paramount. With increased truck traffic affecting conditions on the 39,169 centerline miles of paved and gravel roads, counties are competing on limited budgets to maintain current assets. Agencies are trying to prioritize funding for safety projects, capital projects, bridge repair/replacement, ADA compliance, fish barrier culvert replacement, and pavement preservation projects. When faced with all of these challenges, counties must develop sound management practices to preserve their investments in infrastructure.

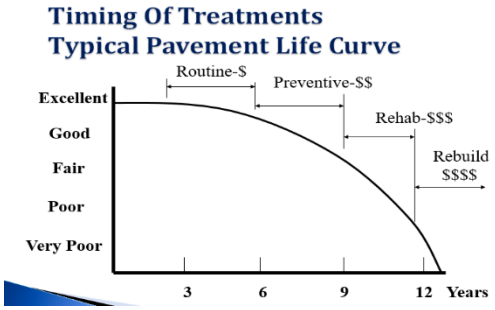
Using a **Pavement Management System (PMS)** is critical to manage the preservation, rehabilitation, and maintenance of paved road systems by analyzing pavement life cycles to assess overall system performance and costs, and to determine the alternative strategies and costs necessary to prevent significant road deterioration. A key element of a PMS is its ability to provide pavement preservation alternatives based upon a predictive pavement deterioration model. An effective pavement management system depends on reliable, accurate, and complete information.

Pavement condition data is a critical component of a pavement management system. It is this data, collected consistently and over a period of time, that determines the current network condition, triggering of pavement preservation and rehabilitation treatments and/or strategies, and prediction of future conditions. Pavement condition data is used to model pavement performance, to trigger various actions ranging from maintenance to rehabilitation to reconstruction, to evaluate program effectiveness, and to satisfy many other purposes. Network condition data—combined with inventory, traffic, and cost data—allows a pavement management system to analyze and compare pavement sections to find the most cost-effective and beneficial combination and treatments.

While there are many different methodologies used for assessing pavement condition, ranging from manual surveys to fully automated procedures, the need for quality and accurate data remains the same. As the needs and uses of network-level condition data evolve, so has the technology to collect it.

In practical terms, pavement preservation boils down to three sound principles: The **Right Treatment**, at **The Right Time**, on **The Right Road**. The best return on pavement preservation dollars is a pro-active approach in maintaining structurally sound pavements in good condition. The intent of a pavement preservation treatment is to extend pavement life at a level that is cost effective and maximizes the service life of the roadway asset.

The cost of pavement preservation increases exponentially with pavement deterioration. Failure to maintain a roadway network at the optimal time dramatically increases maintenance cost, decreases drivability and, may expose the public to increased risk of higher accident rates.



The "True Value" of Pavement Preservation:
The most ineffective, costly way of responding to roadway complaints is a "Worst First" policy. If an agency has postponed maintenance, then structural damage is being done to the road and it will require a major rehabilitation to correct. The "Worst First" strategy waits until roads in the system reach a level where pavement preservation is the most expensive technique available. Sadly, "Worst First" is very appealing politically: it reassures the public that they have been heard because the worst roads are being rehabilitated first. However, in reality, this costly and ineffective policy will eventually return all the paved roads to gravel roadways.

The roadway and pavement information is in the County Road Log, and updated annually as part of the process. Mobility PMS uses the Road Log information directly; counties using another PMS program have a routine to transfer the current Road Log data to their program.

The next step in building the PMS is to design a Decision Tree that best fits the county needs and expectations of the road network. A Decision Tree is a set of "Rules" by which each road segment is evaluated. A Rehabilitation Type, Rehabilitation Date, and Rehabilitation Cost are then calculated for each road segment based on the Decision Tree.

There are three levels of work on pavements:

1. Routine maintenance (pothole repair, patching, crack sealing, etc.), done on an as-needed basis
2. Preservation or rehabilitation (installing a new wearing surface, a seal coat or overlay), done on a cyclic basis
3. Reconstruction (remove and replace the pavement and base structure), done when the road has failed or needs widening or realigning

Mobility© automatically calculates a Pavement Surface Condition (PSC) score for each Surface Condition segment. The PSC formula uses the severity and extent recorded for Transverse, Longitudinal, and Alligator cracking as well as Patching to calculate one score for each Surface Condition segment.

There are three phases in the life of a pavement:

1. When the pavement is in good or better condition and does not need preservation (PSC above 60).
2. When a pavement preservation is cost effective (PSC between 60 and 40).
3. When the pavement is in such poor condition that a pavement preservation is no longer cost effective (PSC less than 40), reconstruction is needed.

Currently, counties perform a visual rating of their paved arterials and collector roads, which must be rated at least once every two years (WAC 136-320); local access roads are rated based on each county's schedule. Rating can be done by county personnel (full time or part time) or by an automated pavement rating service. When county personnel do the visual rating, they usually drive the roads at low speed and rate the distresses. The time needed depends on the rating method and the number of miles rated. Depending on the number of miles rated, it will take anywhere from one to three months. Many of the 39 counties use computerized data collection, entering the data directly into a computer; counties using paper need to enter their data manually.

Once all the data is in the computer, running the PMS processes takes only a few minutes. The engineering analysis of the proposed preservation program can take as long as needed to develop the most reasonable pavement preservation program.

To assist in scheduled pavement condition rating, CRAB developed a software package called VisRate. VisRate can be installed on laptops and used in the field by pavement raters to efficiently record pavement distresses. After pavement raters have finished collecting data, VisRate can upload the data to the Mobility© database, transforming the information into rating segments. Using the pavement condition rating information stored in Mobility©, the Mobility Pavement Management System (MPMS) can better predict pavement performance.

Mobility© organizes pavement condition inspection data into Surface Condition segments. The Road number, "from" and "to" mileposts, lanes rated, and rating date identify Surface Condition segments. The severity and extent of up to 12 visible distresses can be recorded for flexible pavement types (8 for rigid pavement types).

"Regularly scheduled pavement condition inspection is one of the most important steps in implementing a comprehensive Pavement Management System." (Group & Kay, 1992)

Pavement Preservation Options:
Within each Pavement Managers "Tool Box" are numerous pavement rehabilitation options. The key is being able to select the correct rehabilitation that will function in the environmental conditions, handle traffic loading, and provide safety to the public, all the while being cost effective. The following is a list of some Pavement Preservation options:

Asphalt Overlay – An overlay course consisting of a mix of asphalt cement and a well graded (also called dense graded) aggregate. A well-graded aggregate is uniformly distributed throughout the full range of sieve size and is mixed at a central mix plant and hauled to the laydown machine.

Asphalt Concrete Pavement (ACP) - commonly called asphalt, blacktop, or pavement, is a composite material commonly used to surface roads, parking lots, and airports.

Bituminous Surface Treatment (BST) – includes various composite layered pavement treatments that may be applied over existing ACP, Hot Mix Asphalt (HMA), or BST roadways, or are used to build up new roadway surfaces. They generally consist of uniformly sized gravel spread over liquid asphalt layer, which solidifies when it cures. This process creates a thin structure with a very rough surface. Chip seals are the most common form of BST. Slurry seals (also a BST) consisting of a premixed thin layer spread over the roadway surface, and creating a smooth, flat surface.

Chip Seal – A surface treatment in which a pavement surface is sprayed with asphalt (generally emulsified), then immediately covered with aggregate, and rolled. Chip seals are used primarily to seal the surface of a pavement with non-load associated cracks and to improve surface friction, although they also are commonly used as a wearing course on low volume roads.

Whitman County Public Works

Cold In-Place Recycling (CIR) – A process in which a portion of an existing bituminous pavement is pulverized or milled, the reclaimed material is mixed with new binder and, in some instances, virgin aggregates. The resultant blend is placed as a base for a subsequent overlay. Emulsified asphalt is especially suited for cold in-place recycling. Although not necessarily required, a softening agent may be used along with the emulsified asphalt.

Cold Milling – A process of removing pavement material from the surface of the pavement either to prepare the surface (by removing rutting and surface irregularities) to receive overlays, to restore pavement cross slopes and profile, or even to re-establish the pavement's surface friction characteristics.

Crack Filling – The placement of materials into non-working cracks to substantially reduce infiltration of water and to reinforce the adjacent pavement. Working cracks are defined as those that experience significant horizontal movements, generally greater than 2 mm (0.1 in.). Crack filling should be distinguished from crack sealing.

Crack Sealing – A maintenance procedure that involves placement of specialized materials into working cracks using unique configurations to reduce the intrusion of incompressible material into the crack and to prevent intrusion of water into the underlying pavement layers. Working cracks are defined as those that experience significant horizontal movements, generally greater than 2 mm (0.1 in.). Crack sealing has excellent performance in spite of its use where chip sealing or dig-outs may have been a better choice.

Kitsap County Public Works

Emulsified Asphalt – An emulsion of asphalt cement and water, which contains a small amount of an emulsifying agent. Emulsified asphalt droplets, which are suspended in water, may be either the anionic (negative charge) or cationic (positive charge) type, depending upon the emulsifying agent.

Fog Seal - A fog seal is a light application of a diluted slow-setting asphalt emulsion to the surface of an aged (oxidized) pavement surface. Fog seals are low-cost and are used to restore flexibility to an existing HMA pavement surface. They may be able to temporarily postpone the need for a surface treatment or non-structural overlay.

A fog seal is designed to coat, protect, and/or rejuvenate the existing asphalt binder. The addition of asphalt will also improve the waterproofing of the surface and reduce its aging susceptibility by lowering permeability to water and air. To achieve this, the fog seal material (emulsion) must fill the voids in the surface of the pavement. Therefore, during its application it must have sufficiently low viscosity to not break from the emulsified state before it penetrates the surface voids of the pavement. This is accomplished by using a slow setting emulsion that is diluted with water. Emulsions that are not adequately

diluted with water may not properly penetrate the surface voids resulting in excess asphalt on the surface of the pavement after the emulsion breaks, which can result in a slippery surface.

The use of a fog seal on top of a chip seal has become the industry standard and is good insurance to protect a new chip seal.

The benefits are numerous:

- A fog seal puts more asphalt between the "chips," to hold the rock better, greatly reducing the amount of shedding.
- Much less sweeping needed over the first winter.
- The black color gives better contrast for striping.
- The aesthetics of a black street are more acceptable to the public
- It takes away some of the coarseness, slightly smoothing the surface

Kitsap County Public Works

Hot In-Place Recycling (HIR) – A process which consists of softening the existing asphalt surface with heat, mechanically removing the surface material, mixing the material with a recycling agent, adding (if required) virgin asphalt and aggregate to the material, and then replacing the material back on the pavement.

Hot Mix Asphalt (HMA) – High quality, thoroughly controlled hot mixture of asphalt cement and well-graded, high quality aggregate thoroughly compacted into a uniform dense mass.

Microsurfacing – A mixture of polymer modified asphalt emulsion, mineral aggregate, mineral filler, water, and other additives, properly proportioned, mixed and spread on a paved surface.

Open-Graded Friction Course (OGFC) – An overlay course consisting of a mix of asphalt cement and open graded (also called uniformly graded) aggregate. An open-graded aggregate consists of particles of predominantly a single size.

Pavement Reconstruction – Construction of the equivalent of a new pavement structure which usually involves complete removal and replacement of the existing pavement structure including new and/or recycled materials.

Recycling Agents – Organic materials with chemical and physical characteristics selected to address binder deficiencies and to restore aged asphalt material to desired specifications.

Rejuvenating Agent – Similar to recycling agents in material composition, these products are added to existing aged or oxidized HMA/ACP pavements in order to restore flexibility and retard cracking.

Rubberized Asphalt Chip Seal – A variation on conventional chip seals in which the asphalt binder is replaced with a blend of ground tire rubber (or latex rubber) and asphalt cement to enhance the elasticity and adhesion characteristics of the binder. Commonly used in conjunction with an overlay to retard reflective cracking.

Sand Seal – An application of asphalt material covered with fine aggregate. It may be used to improve the skid resistance of slippery pavements and to seal against air and water intrusion.

Sandwich Seal – A surface treatment that consists of application of a large aggregate, followed by a spray of asphalt emulsion that is in turn covered with an application of smaller aggregate. Sandwich seals are used to seal the surface and improve skid resistance.

Scrub Seal – Application of a polymer modified asphalt to the pavement surface followed by the broom scrubbing of the asphalt into cracks and voids, then the application of an even coat of sand or small aggregate, and finally a second brooming of the aggregate and asphalt mixture. This seal is then rolled with a pneumatic tire roller.

Slurry Seal – A mixture of slow setting emulsified asphalt, well-graded fine aggregate, mineral filler, and water. It is used to fill cracks and seal areas of old pavements, to restore a uniform surface texture, to seal the surface to prevent moisture and air intrusion into the pavement, and to provide skid resistance.

Federal Requirements

In the immediate future, Federal Highway Administration (FHWA) requirements may lead to additional data collection requirements. FHWA requires that IRI (International Roughness Index) be collected annually on roads comprising the NHS routes, which typically includes interstates, while the non-NHS routes may still be collected on a two-year cycle (FHWA 2010) AASHTO R 43. The national standard in the United States for IRI thresholds for all road classifications range from 96 in/mi to 170 in/mi, indicating "acceptable" road segments, and IRI less than 95 in/mi are considered to be "good" road segments.

MAP-21 created a performance-based and multimodal program, establishing new requirements for setting performance targets for Interstate pavement (and bridges on the National Highway System) condition as part of an Asset Management Plan.

While many transportation agencies across the United States collect individual pavement distresses at the network level and then use those to create various individual indices, other agencies collect an overall condition indicator, such as present serviceability rating (PSR), present serviceability index (PSI), pavement condition index (PCI) and Washington State – Pavement Surface Condition (PSC).

Friction Testing

Several counties are in the process of updating their roadway safety plans, which may include using the Systemic Safety Project Selection Tool in Mobility©. Some data points to looking at reducing run-off the roadway accidents using low cost countermeasures. In general, the friction of most dry pavements is high; however, the same pavement under wet conditions can present a friction problem. Surface friction data allows agencies to identify potential low friction pavements that, in conjunction with accident history and roadway geometrics are used to minimize wet weather skidding accidents. This will allow county traffic engineers to be both proactive and reactive when developing potential safety projects, and assist in assuring the best use of public funds.

Washington State Department of Transportation measures surface friction every two years on all state-maintained roads using a friction testing truck and trailer. To conduct friction tests, water is applied to the pavement surface in front of the test wheel on the trailer. A brake is applied to the test wheel and when the wheel locks, the drag and load (horizontal and vertical forces) are measured to derive the amount of surface friction.

Geographic Information Systems (GIS)

GIS, as used in the context of asset management, are tools designed to integrate data and provide a platform for examining, visualizing, and managing pavement data. The condition survey data elements can be visualized on a map as long as the data has been located geographically. For example, GIS can be used to plot the collected data on a shape file of the road network to check the accuracy of the segmentation process and

the collected latitude and longitude data. If a segment has been missed, a faulty beginning point assigned, or the data otherwise improperly segmented, it is often readily apparent by visualizing the data using the GIS. The ability to examine the data visually is useful in many ways, such as comparing data from each side of a divided highway, or comparing radius of curvature with the map display of the location and seeing gaps or overlaps.

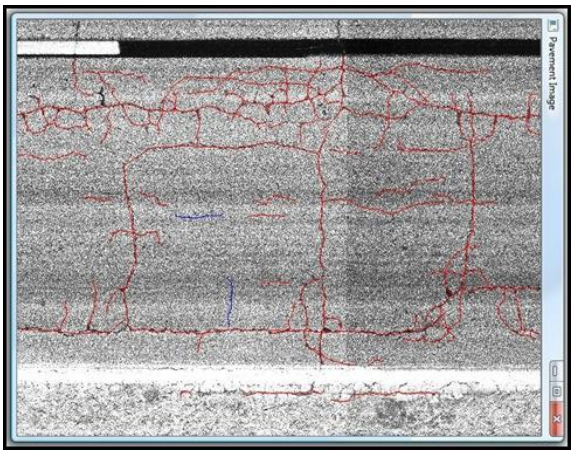
The County Road Administration Board is in the process of replacing the legacy Mobility© application, and the Linear Reference System (LRS) it manages, with a modern, innovative, commercial-off-the-shelf (COTS) enterprise asset management system (EAMS) named GIS-Mo. This geospatial emphasis software system will improve the county engineer's data-driven decision-making capabilities.

The software used to manage the assets will consist of an Esri platform and VUEWorks asset management system. The primary objective of GIS-Mo is to improve the timeliness, accuracy, completeness, uniformity, integration, and accessibility of just over 39,000 miles of Washington State county roads, and road related assets.

Future technology - Automation Pavement Distress analysis

With advances in new and innovative technology with mobile asset collection, windshield surveys could be replaced with an automated collection of data and images. Automated methods for quantifying pavement distress measurements have shown some interesting results. How great would it be to collect pavement images, batch them on a server, and have it produce accurate pavement distress maps that you can overlay in a GIS? Infrared and Lidar are currently being used for pavement management by some agencies, and the technology is here!

Most pavement inspections involve intricate processes where pavement experts rate segments visually, from field visits and at times in the office. This introduces a lot of subjectivity in the rating results and typically culminates in a Road Log showing pavement ratings by segments.



VUEWorks 2

Impacts to roadway surfaces

Traffic engineers are tasked to utilize safety technology for keeping cars on the roadway. This includes installing recessed centerline rumble strips, and recessed markers, shoulder rumble strips, and recessed pavement striping (thermoplastic). These added safety features (most alert the driver that they are leaving the travel way) in the roadway prism are providing great results for reducing run-off-the roadway departure collisions. However, they are also proving to be a structural weak point in our paved roadway surface. The tendency is for water to pond in these recessed areas, which weakens the layers, creating delamination and collects debris. A higher frequency of street sweeping is required at these locations as well as applying an asphalt rejuvenator every three to four years.

The pavement segments that are receiving the rumble strips should be in good condition and the depth should be thick enough to support them. Grinding rumble strips into inadequate pavement has led to premature pavement failure. Installing rumble strips in Bituminous Surface Treatment is not recommended, unless the BST was applied over an existing HMA or ACP roadway surface.

Recessed centerline rumble strip markers - shoulder rumble strips

Centerline recessed pavement marker strips

Recessed pavement striping

In closing, strong communication of need to decision makers and a long-term commitment are necessary to be successful. Failure to maintain a roadway network at the optimal time dramatically increases maintenance cost, decreases drivability, and may expose the public to increased risk of higher accident rates. The cost of pavement preservation increases exponentially with pavement deterioration. Therefore, the three sound principles for pavement preservation should be followed - The **Right Treatment**, at **The Right Time**, on **The Right Road.**

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