

MARION COUNTY

ROAD AND BRIDGE

5-YEAR

PLAN

“Taxes, after all, are dues that we pay for the privileges of membership in an organized society.”

Franklin D. Roosevelt

Marion County Commission candidate Dan Holub 10/22-2019 Hillsboro Free Press

“In some instances the taxes are surprisingly low. The County values property for tax purposes (assessed value) and mails the assessed value to property owners. This assessed value is used not only by the county but by all taxing entities in the county. Then all the taxing entities turn their tax levies over to the County who compiles the tax bill and sends it to tax payers. Once the taxes are paid to the county, the county then forwards each taxing entity their share. It is done this way for efficiency. The downside is the county many times gets credited for the entire tax bill, when in fact the county share is usually around half depending on location.

Having said that, this year some people complained they were not getting the gravel their taxes paid for. The following scenario is accurate with rounding of numbers used only for one location:

\$150,000 home- Total tax-\$2395 County share- \$1235 Road and Bridge share of county share-\$405 Total Gravel Department share of \$405- \$99 Maintenance Gravel line item- \$50 Rebuild gravel line item- \$13 The actual amount of tax from the \$2395 tax bill devoted to gravel is \$63. The cost for a mile of gravel at 500 tons per mile is \$5000-\$6000 depending on cost of gravel (varies \$11-\$12 a ton). Having your road graveled for \$63 is a bargain.”

Based on rough estimates from the County Treasurer, Marion County receives approximately ½ of the taxes paid, the other ½ going to schools and such. Of the 50% Marion County gets, Road and Bridge gets 35% and roughly 14% goes to rock roads.

What does all this mean? Taxes are paid by everyone for county services, even people in the cities pay county taxes. All governments, especially local, are not set up to be efficient in that our work crews provide services in a group workflow arrangement. However, we must be ACCOUNTABLE AND RESPONSIBLE stewards of this money. As County Engineer of Marion County Road and Bridge I provide this information of the issues and budgetary constraints that this department faces and assure the taxpayers of Marion County that Road and Bridge Department is doing everything in their power to be ACCOUNTABLE AND RESPONSIBLE in our actions and responses.

Marion County is a rather large county in size but small in population compared to others counties in Kansas. Encompassing 954 SQ. Miles with approx. 200 miles of paved roads, 800 miles of gravel roads and 600 miles of dirt roads it is difficult to maintain the roads and bridges. The 2020 the budget for Road and Bridge is around \$7 Million dollars, split between administration, shop, equipment, roads and structures.

ROAD DESIGN

Several terms of roadway design need to be addressed. First, subbase or subgrade means the material below the base or pavement. This is typically the compacted dirt placed by the contractor. It can also be fly-ash or lime treated which reducing the swell possibility and also provides for structural support.

Base typically consists of a rock material on top of the subbase or subgrade. Some pavements have them, others don't, depending on the situation that it is being built for. It may also be "bound" with cementitious materials or "unbounded", just compacted with optimal moisture.

Pavements can be either HMA (Hot-Mixed Asphalt) or PCCP (Portland Cement Concrete Pavement). Each material has its benefits and associated costs based on what the requirements are for the use of the roadway. Most new pavements on large, highly traveled roads are made of PCCP because of its structural benefits but HMA can also be used if it is more economical to use because of location. Most "county" projects use HMA because of the reduced costs over PCCP for the applications required.

Whatever material is used, it must be placed with a final width and cross-slope to provide safe passage of the traveling public. The width is obviously what is required based on traffic volumes but the cross slope varies, typically 1.6% to 2%. This means that the slope falls at this percent from the center of the pavement to the outside edge to provide for moisture to get off the pavement for safety. These percentages correlate to 3/16"/ft for 1.6% and 1/4"/ft for 2%. Highways use these standards but lower volume county roads can be increased in slope to provide better drainage and not risk safety to the traveling public.

PAVED ROADS

Marion County has approx. 200 miles of “paved” roads. Industry standards define a “paved” road as at least 6-8 inches of HMA. Only a couple of roads in Marion County meet that criteria; 190th between Hillsboro and Marion, possibly Sunflower between Highway 50 and Marion and 330th Rd west of Tampa. These roads have been built and maintained for the “long haul”, being able to be recycled or overlaid with HMA to allow continued “satisfactory” performance. The rest of the roads is another story.

The old adage that you can’t build a house without a solid footing or foundation holds true for road construction as well. The remaining roads in Marion County typically consist of 1) a former rock road that was covered with maintenance cold patch or chip seals, 2) a former paved road that was turned back to rock and then covered with maintenance cold patch or chip seals, or 3) a combination. Regardless, these roads don’t have the capability to resist large traffic volumes or heavy farm loads. They crack, rut or generally degrade every year, especially during extended periods of bad weather, very hot weather, or high moisture. Kansas also experiences one of the largest temperature swings in the county from high to low, over 100’s to less than 0. This huge temperature swing causes many stresses on the roads.

Maintenance, either preventative or overlays, can extend the serviceable life of pavements, if completed within a reasonable time. Crack sealing is one way to reduce water infiltration into the base since asphalt cracks due to stresses like traffic, weather changes and UV radiation. This is why asphalt turns gray after many years on the ground. Chip sealing is another alternative maintenance operation, but it just seals the road with a coat of asphalt and material is placed on top for skid resistance. It provides no structural stability increase for the road. Regardless, maintenance operations must be done before permanent structural damage has occurred or it is a waste of money.

Asphalt overlays, either virgin or recycled, are the most beneficial for roads for stabilizing pavements. However, they are also the most expensive. Nominal overlays of 2” are very common, but do not change the cross-slope of the road as much as other alternatives. Milling prior to overlaying provides two-fold benefit; providing millings to recycled into the new mix thus reducing the price, and

changes in cross-slope can be made. However, this costs more because of the milling operation. More contractors and mobilizations cost more money.

Multiple layers of asphalt are another option as well and provide another chance to make cross-slope changes, but again more material and labor increases the cost.

HIR (Hot In-Place Recycling) is another option that is available. This process heats up the existing material, which is milled up (usually 1-2") and then rejuvenated with polymer oils and then repaved in the same process. It is a good option for most roads but again costs significant money because of the specialized equipment.

CIR (Cold In-Place Recycling) provides another alternative. This process mills up the existing material (usually no more than 4") at ambient air temperature and is then mixed with cementitious materials, like cement, fly-ash or others, and then repaved in place. FDR (Full Depth Recycling) falls into this category. Again, with either option, significant costs with specialize equipment.

So, what is the best alternative? It depends on what you want to receive from the outcome and budgets.

BASE AND SUBBASE PROBLEMS

As stated before, before roads can be worked on with whatever alternative chosen, the supporting base must be considered. Most of the roads that have less than the minimum HMA suggested will not perform well after the alternatives from above if the base cannot support the HMA. For instance, if a 2" HMA overlay is placed over a poor base (assuming the trucks don't fall through the existing pavement) it will only last a couple of years, depending on conditions. However, the same overlay on a good base may provide 10-20 years of satisfactory performance. Therefore, the base must be the first consideration.

One option for base work is to "Unpaved" the road, in essence tear up the road and return it to an HMA/rock road and leave it that way for several years until the base returns to a normal condition. Proper operation and mixing of the existing road and then grading a proper cross-slope for drainage can provide

many years of good service. Then the roadway can be overlaid or just left in the rock state, therefore reducing maintenance costs substantially.

Another option is FDR (Full-Depth Recycle). This process mills up the entire roadway anywhere from 6-12" and mixes it with a cementitious material (usually cement) and then repaved on the milled surface. The process mixes air and cement in to the pavement and thus dries it out and also provides some structural support when repaved and compacted. It is also milled afterward to provide for the proper cross-slope. Then the newly paved roadway must be sealed with at least a double chip-seal or HMA overlay to seal the roadway from the elements.

EXISTING PAVEMENTS

Due to the ease of budgetary issues Marion County has used the rough number of 200 miles of paved roads. The following spreadsheet was made in October 2019 showing the existing condition of the roads, the proposed operation for repair, and the associated costs. Marion County has \$5.4 Million in the Capital Improvement budget for 2020 but considerably more work is required than the budget allows.

Road and Bridge is also budgeted \$500,000 a year for asphalt projects, of which \$240,000 will be spent on 90th west of K-15 (2 miles). Marion County was fortunate to get a contractor working on a KDOT project on K-15 already to provide us a very good estimate to complete this overlay.

Road and Bridge also spends several hundred thousand dollars a year "blade patching" which is taking cold asphalt mix and placing it in the bad areas of the roadway. However, this is only a short-term band-aid but keeps the road in a safer driving condition.

LOCATION	MILES	2017 ADT	RECOM	COST/MI	TOTAL COST		
Indigo from HV Co L to Hillsboro	11.5	1090	4	\$ 220,000.00	\$ 2,530,000.00		
190th from K-256 to US-56 (minus Hillsboro)	11	1055	4	\$ 220,000.00	\$ 2,420,000.00		
Upland from County Lake North to K-256	1.5	800	3	\$ 200,000.00	\$ 300,000.00		
Sunflower from US-50 to Marion	10	700	4	\$ 220,000.00	\$ 2,200,000.00		
Nighthawk from US-50 to US-56	13	460	2	\$ 125,000.00	\$ 1,625,000.00		
120th from Goessel to Indigo	7	445	4	\$ 220,000.00	\$ 1,540,000.00		
Kanza from US-56 to Fertilizer plant	2	415	2	\$ 125,000.00	\$ 250,000.00		
90th from MP/MN Co to K-15	2	365	2	\$ 125,000.00	\$ 250,000.00		
Old Mill from BU Co L to 60th	6	350	2	\$ 125,000.00	\$ 750,000.00		
290th from K-15 to US-56/77	14.5	345	4	\$ 220,000.00	\$ 3,190,000.00		
330 E from Tampa to Quail Creek	5	295	2	\$ 125,000.00	\$ 625,000.00		
330th from K-15 to Tampa	4	260	0		\$ -		
60th from HV/MN Co L east CL Peabody	2.2	255	2	\$ 125,000.00	\$ 275,000.00		
60th from Peabody to Timber	5	245	3	\$ 200,000.00	\$ 1,000,000.00		
330th from MP Co L to K-15	8	235	0		\$ -		
Kanza from US-56 to 290th	9	230	2	\$ 125,000.00	\$ 1,125,000.00		
Limestone from 290th to 330th	4	225	2	\$ 125,000.00	\$ 500,000.00		
Ramona west and north to DK Co L.	2	210	0		\$ -		
County Lake road including 170th	3	200	3	\$ 200,000.00	\$ 600,000.00		
Remington from US-56 to 290th	9	200	3	\$ 200,000.00	\$ 1,800,000.00		
150th from K-15 to Indigo	7	180	1	\$ 30,000.00	\$ 210,000.00		
Quail Creek from 290th to Ramona	7	170	1	\$ 30,000.00	\$ 210,000.00		
Timber from 60th to 40th	2	170	3	\$ 200,000.00	\$ 400,000.00		
340th from US-56/77 to MR Co L	1	170	2	\$ 125,000.00	\$ 125,000.00		
340th from Quail Creek to US 56/77	6	165	1	\$ 30,000.00	\$ 180,000.00		
285th/290th West of Durham to Diamond	8	160	1	\$ 30,000.00	\$ 240,000.00		
140th from US-77 to Aulne	6	155	1	\$ 30,000.00	\$ 180,000.00		
Kanza from Fertilizer plant to 140th	4	140	1	\$ 30,000.00	\$ 120,000.00		
Eisenhower St. North of Marion	0.5	120	6	\$ 400,000.00	\$ 200,000.00		
Timber from 40th to BT Co L	3	110	0		\$ -		
140th from Indigo to Kanza	2	100	1	\$ 30,000.00	\$ 60,000.00		
Nighthawk from 60th to US-50 (short)	1	60	2	\$ 125,000.00	\$ 125,000.00		
40th from Timber to US-77	5.5	60	3	\$ 200,000.00	\$ 1,100,000.00		
GRAND TOTAL	182.7				\$24,130,000.00		
	ASSOCIATED COSTS PER MILE						
1	BACK TO ROCK				30000		
2	12" FDR AND DOUBLE CHIP SEAL				125000		
3	2" HMA OVERLAY				200000		
4	PROFILE MILE WITH 2" OVERLAY				220000		
5	LEVELING COURSE AND 1 1/2" OVERLAY				300000		
6	6" AB-3 AND 4" ASPHALT				400000		
	NOTES:						
	200 ADT break between rock and HMA (< 200 ADT MEANS TURN BACK TO ROCK)						
	2019 costs						
	RED IS CRITICAL TO PRESERVE ROAD IN 2020						
	2017 ADT FROM KDOT						

As the spreadsheet shows Road and Bridge doesn't have anywhere near enough money to handle all the repairs needed to our roads without some other form of revenue. One option to consider is to reduce the number of paved roads in the county but this is a very political issue. But our plan for the next 5 years will do some maintenance on the roads to provide more time to find more revenue.

MAINTENANCE

Two options available include chip sealing and crack sealing. Crack sealing has not been done to much extent in the past but it needs to be for the future. This practice fills cracks with asphaltic rubber to keep materials and water out of the joint and thus reduce the amount getting into the base. Again, it is only a minor fix but can be beneficial if the crack is sealed at the optimum time.

Chip sealing is a little more beneficial to the preventative maintenance issue in that a heavier layer of oil is sprayed on the pavement to seal not only the cracks but also the roadway. Then a cover material is placed on the hot oil which allows it to seat or bed into the oil. This provides only a skid resistance and the process basically provides no structural stability to the pavement. Many of our paved roads have been built this way.

Here is our 4-year plan to chip seal existing roads:

2020

Pawnee Road from Highway 56 to 230 th , including the dam	4.0 miles
Sunflower Road from 190 th to Highway 50	11 miles
140 th from Sunflower to Highway 77	3.5 miles
Old Mill from 60 th to 10 th	5 miles
30 th from Limestone to Old Mill	3 miles
Airport Road and County Lake	6 miles
Eisenhower from 190 th to Highway 56	<u>1 mile</u>
Total	33.5 miles

2021

190 th from Remington to Goldenrod (minus Hillsboro)	12 miles
Jade from 190 th north ½ mile	.5 miles
120 th from Indigo to K15	8 miles
90 th from K-15 to Chisholm	1 mile
60 th from Old Mill to Timber	5.5 miles
Timber from 60 th to 40 th	2 miles
40 th from Timber to Highway 77	<u>5.5 miles</u>
Total	34.5 miles

2022

Indigo from 190 th to 70 th	13 miles
150 th from Indigo to K15	7 miles
Remington from Highway 56 to 290 th	9 miles
Kanza from 140 th to 290 th	<u>15 miles</u>
Total	44 miles

2023

290 th from Diamond to Highway 77	19 miles
Limestone from 290 th to 330 th	4 miles
330 th from Meridian to K15	8 miles
Quail Creek from 290 th to 370 th	9 miles
340 th from Quail Creek to Xavier	<u>7 miles</u>
Total	47 miles

Chip sealing costs (materials only) around \$15,000/mile. Labor and equipment are budgeted in other line items. Again, chip sealing does very little to make the pavement better, it just extends the inevitable larger expense of major work.

GRAVEL ROADS

Marion County has approximately 800 miles of gravel roads with a budget of \$900,000 (2020) and \$200,000 (2020) for reconstructions. With rock running \$8.00 up to \$12.00 and maybe more, not including freight, it is a daunting task. Mother nature has not been kind to us in the last year either.

To put the rock issue in perspective, consider this:

800 miles of road x 5280 ft/mile = 4,224,000 linear feet of road

Placing rock 2" thick and 20' wide (conservative) =

4,224,000' x 0.167' thick x 20' wide = 14,108,160 Cu Ft of rock

Conversion of rock from Cu Ft to tons (130 Lbs/Cu Ft average)

14,108,160 Cu Ft x 130 Lbs/Cu Ft / 2000 Lbs/Cu Ft = 917,030 TONS

Therefore, at a minimum of \$8.00/ton that amounts to \$7,336,240 to rock every road in Marion Co a year. Another way to look at it is that a \$900,000 budget spread over 800 miles means \$1,125/ mile of road for rock. One load of \$8.00 rock at 25 tons costs \$200 (material only) and depending on how bad the road is it could take 500-1000 tons per mile. It becomes evident that we have to place rock as prudently as we can so as to not exceed the budget.

Marion County Road and Bridge typically operates 5 dump trucks able to carry 10-15 tons of material each load. Again with 960 SQ Miles it takes a long time per load to reach the extents of our borders. During muddy times we also contract with local trucks to haul for us, but this "extra" expense also comes out of the budget.

Again, Road and Bridge is also budgeted for \$200,000 for road reconstruction. Reconstruction involves cleaning and possibly reshaping ditches, cleaning or installing culverts, tree removal, removing false shoulders and reshaping the road to a more appropriate cross slope of 4% or steeper. This cross slope allows rain and snow to leave the road faster and not sit and soak in, thus making mud. By creating the proper cross-slope it also eliminates the potholes that come from flat roads. Potholes are caused by flat roads that hold water, making mud holes, and then dry out to make the void in the road. Most of our county roads are also wider than needed which creates more demand for rock and takes longer to maintain, requiring more than 2 passes and may require up to 4 passes. This reconstruction process takes approximately 1 week per mile with 4-5 employees, depending on the extent of the work done.

Reconstruction is the best option for fixing the roads but also requires a significant amount of money.

Base rock (2") @ \$11.00/ton @ 800 tons/mile =	\$8824.00
Cover rock (1") @ \$8.50/ton @ 600 ton/mile =	\$5100.00
Sand @ 5.00/ton @ 100 ton/mile =	<u>500.00</u>
Total	\$14,424.00/mile

So, at \$14,424/mile it allows us to complete approx. 14 miles per year.

One solution to the problem of rock and reconstruction is to reduce the amount of rock roads in the county. This can be a very difficult and time-consuming operation because of the necessary legal implications.

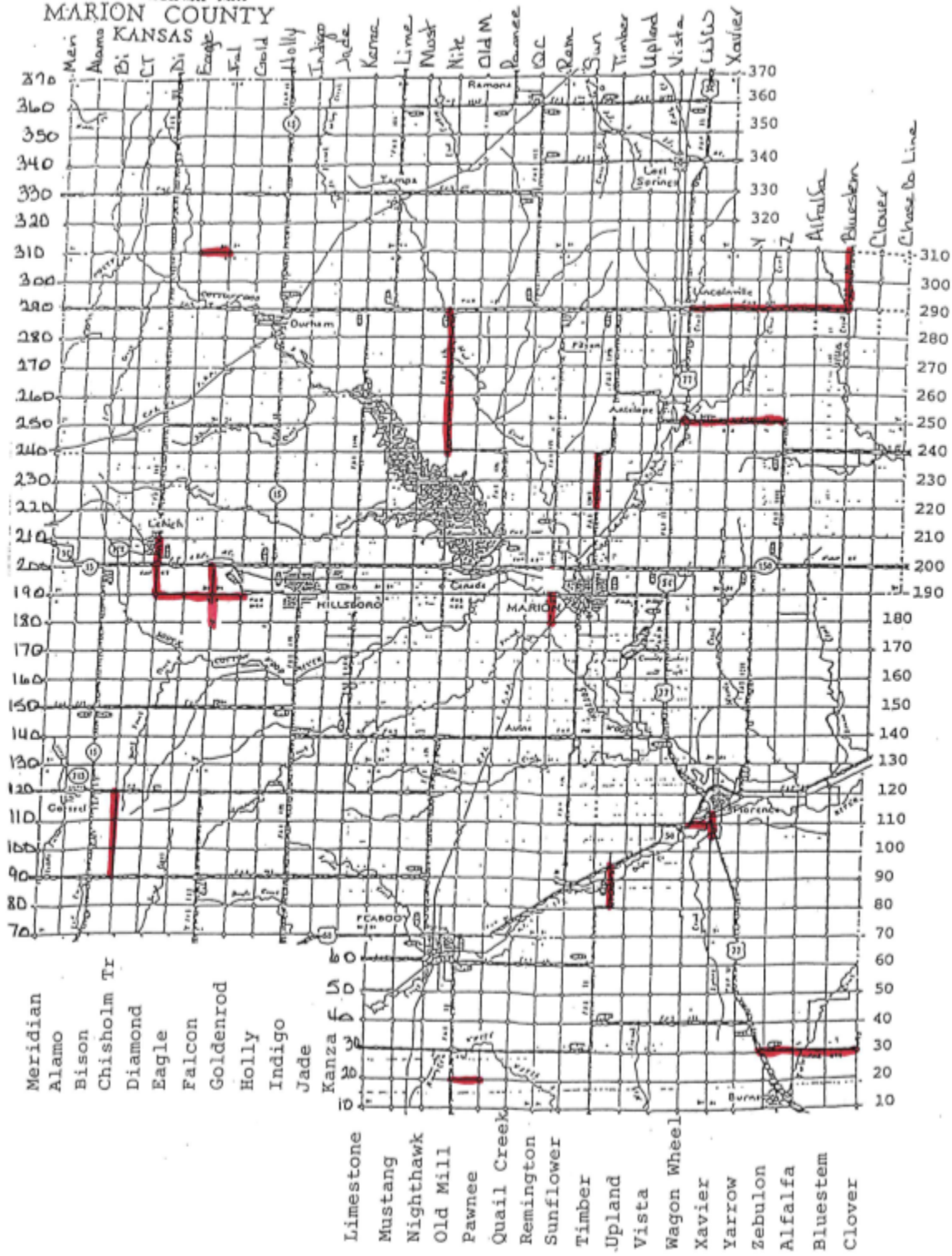
Another solution to the problem of rock and reconstruction is to haul in "hard" rock; essentially rock from other quarries that has better test result for durability and wear. They hold up better under freeze/thaw and water absorption and take longer to wear down. The biggest downfall to this "hard" rock is the hauling charge which usually costs more than the aggregate itself.

Most of the quarries with "hard" rock are at least 40 miles from Marion, some as much as 70 miles. These miles are based back to Marion so that hauls farther north and west could add many more miles. These rock haul prices usually run in the \$4/load mile range, depending on the total distance. So, you take a 25 tons load at \$8.00/ton = \$200 but then add 70 miles at \$4.00/loaded mile = \$280 the total cost of the load becomes \$480/load, or \$19.20/ton. It also reduces the amount of rock hauled per day due to the length of the drive. These hauls usually result in 2-3 loads per day compared to 5-6 from local quarries. This "hard" rock is better but results in less rock and less roads being covered.

Based on existing budgets, here is a list of 37 miles roads that are planned to be rebuilt in the next 2 years, subject to weather and other factors. Some require more extensive work than others but these have been our biggest problems to work with. We are optimistic that we can complete these within the budget.

GENERAL HIGHWAY MAP
MARION COUNTY
KANSAS

2020-2021 ROAD REBUILDS



CRUSHED CONCRETE

Marion County is fortunate to have been able to obtain the PCCP removal from the KDOT project north of Lincolnville for this year. We are in the process of getting a storage site and will crush the concrete to our requirements for size. This material is better than rock in that the cement that it is bound together with makes the material harder, less absorptive of water, less dusty and it will also be less expensive than quarry rock since we will receive it for free and only have to spend money to crush it. Based on the volume this price could/should be around half of the appropriate cost from the quarry.

We are also hopeful that we can obtain the remaining portion to be done next year as well. KDOT retains the right to the stockpile north of 340th next to US-56/77 on the east and we hope to get permission from them to get that material as well. The stockpiles north of 340th on the west side are privately owned.

Crushed concrete provides a great material to build road bases out of because of its strength and bonding capacities. Once covered with cover material it provides a great base to maintain. Almost all of the metal and reinforcing is removed in the crushing process and will essentially provide material free from items to puncture tires.

DIRT ROADS

Marion County also has approx. 600 miles of dirt roads, that unfortunately don't get the same priority as the other roads. However, we still need to maintain these for farm to market access, livestock feeding and travel in general. Due to the floods and excessive rainfall from this last year and poor issues from the past these roads have ditches silted in and associated culverts as well, poor grade and crown and also trees and farmland encroaching into the roadway. All these things require extra time and effort to work with. One good thing about dirt roads is that we have considerably more time to work on them as these can be done in the winter, as long as it is not too muddy.

Some very large projects loom in the county because of flooding through the years. Roads such as Eagle between 160th and 170th and Goldenrod between 160th and 170th have lost 5-10' of dirt in the roadway, essentially making access into fields impossible or very difficult even with temporary work. These projects, and others in the area, could prove to be over \$100,000's of dollars and outside of the county's ability to complete. Contractors would have to be hired to complete them.

STRUCTURES AND BRIDGES

Marion County is also tasked with building and maintaining bridges and culverts in the county with \$200,000. This amount including culverts, which we spend \$50,000 to \$80,000 a year, and bridges. A new concrete bridge costs \$250,000 and up, depending on the size and location. Due to Federal and State budget constraints, most Federal money administered by the State has been minimal at best, thus making the counties provide most of the funding themselves, or pushing off construction/repairs until money is available.

Based on the 2018 County Bridge Inspection Data done by a consultant, replacement costs of \$9,510,000 for Off-System bridges (county owned) and \$1,190,000 for Rural System bridges (Federal-Aid partially funded) are noted. Does this mean the bridges/culverts are going to collapse? Probably not, but they are not going to get any better unless maintenance/replacement is done, or they are closed to traffic until such time repairs/replacement can be done.

EQUIPMENT

Marion County Road and Bridge takes pride in the equipment in our fleet that we currently have. We have a good fleet of dump trucks and motorgraders along with other supporting equipment to provide the needs required by our roads. However, we would be amiss if we didn't consider keeping this equipment updated and current to prevent excessive maintenance costs and downtime. Our 2020 budget for equipment is \$400,000. Here is our list of dump trucks and motorgraders as of now.

EQUIPMENT #	DESCRIPTION	YEAR	HOURS/ MILES	YEAR TO REPLACE	COMMENTS
182	IHC Dump Truck	2018	102,000		
173	IHC Dump Truck	2006	495,000		
170	IHC Dump Truck	2006	1486		
179	Truck	2015	211,921		
184	Sterling Dump Truck	2003	201,938		Dedicated snow ops
171	Sterling Dump Truck	1996	250,237		Dedicated snow ops
167	Mack Dump Truck	2005	386,700		
175	IHC Dump Truck	2011	102,869		
177	Sterling Dump Truck	2000	210,493		Dedicated snow ops
183	IHC Dump Truck	2018	103,000		
152	IHC Tandem Dump Truck	2002	622,344	2020	sell for new haul truck
178	Kenworth Dump Truck	2008	409,628	2020	sell for new haul truck
757	140 Cat Motorgrader	2006	14,500	2021	
761	140 Cat Motorgrader	2006	15,012	2021	
759	140 Cat Motorgrader	2006	15,770	2021	
752	Volvo Motorgrader	2014	5,500	2020	
753	Volvo Motorgrader	2014	5,025	2020	
754	Volvo Motorgrader	2014	5,500	2020	
742	12h Cat Motorgrader	2004	15,700	2022	
748	12m Cat Motorgrader	2009	9,200	2022	
747	120m Cat Motorgrader	2009	9,800	2022	
763	140m2 Cat Motorgrader	2011	7,000	2023	
751	140m2 Cat Motorgrader	2011	9,000	2023	
755	120m2 Cat Motorgrader	2013	4,500	2023	
741	12h Cat Motorgrader	2004	13,300		CBK00539
745	120h Cat Motorgrader	2004	15,600		CBK00551
767	120h Cat Motorgrader	1995	14,000		04MK00063
743	12h Cat Motorgrader	1997	14,000		needs motor 4MK00441

Road and Bridge typically keeps 5 dump trucks constantly hauling rock in the county, depending on drivers. We have the capability to pull other drivers out of other equipment and into trucks when needed. Currently our dump truck situation is good but we want to get rid of 2 dump trucks, one for high miles and one because of high maintenance costs. These dump trucks would help offset the purchase of another haul truck, with belly dump trailer. Currently we only have one semi-tractor to use for the haul trailer and if it goes down, we can't haul any equipment. By purchasing a belly dump trailer we want to see the benefits versus costs of hauling more material per trip and keep the new haul truck busy.

The biggest concern currently is replacement of our motorgraders. These are the most essential items for our department and the primary means of taking care of the county. Operation is essential and downtime is very costly, both in time and money. Road and Bridge has 3 mechanics at this time but that can change at any time. If we can reduce these repairs, then the mechanics can spend more time on the supporting equipment and preventative maintenance.

In order to replace these aging motorgraders, Road and Bridge proposes to set up a replacement plan of lease/purchase 3 motorgraders for 4 years. This process would replace all motorgraders within 4 years and then allow us to continue the process having very good resale value for trade ins. With our current motorgraders we lose resale value every year of use and depreciation.

Our first concern would be to trade-in our Volvo motorgraders. These motorgraders were a very good purchase in 2014, right before Volvo decided to stop making and supporting them. Therefore, after five years of use, the warranty has expired and we have experienced many problems with their operation. Parts are still available, if they can be found, but come at a large expense and can take considerable time to get here, thus having more downtime. The biggest downside to these motorgraders is the support on the computer/electrical problems that we have faced. Even the Van Keppel salesman (they took over the Volvo line) has said to get rid of them because of these reasons. In fact, they were unable to fix a motorgrader last year and had to send it back out. No support is available at the headquarters for motorgraders.

We would then like to start replacing the older machines in order to reduce the maintenance costs. We currently have 4 extra blades, one needs substantial work, that we use for spare blades including blade patching. We would like to get these into the replacement program as well.

As far as other equipment requests for the next 5 years would be 2 tractors to be used for pulling the Rome disk as well as sheepsfoot roller, when our regular tractors would be used for mowing. Each tractor, being used, would run between \$20-50,000 dollars depending on what would be available.

A 6' flail mower that would be PTO mounted and would provide better mowing for our gravel/rock roads. Our current rotary boom mower is 13 years old and should be replaced in the future too. The rotary boom mower allow access out farther than other mowers but with the rotary blades has a tremendous amount of care and maintenance. Flail mowers are more durable and less maintenance for the terrain we mow in. This mower should be around \$15,000.

A new backhoe would also be essential in the future as our "newest" backhoe is over 10 years old, and is needing some bushing and hose updating. Our "backup" does not have the extendable boom or thumb on it so it is not as versatile as the other one and is limited in its operation.

As stated before we want a new haul truck with belly dump trailer to provide another avenue for a haul truck as well as hauling rock. This combination should be less than \$100,000 with used truck and new trailer.

A replacement plan for motorgraders is the largest equipment investment for Marion County. Most counties in the local area have such a plan in place. Based on general numbers (without the actual equipment replacing) this cost should be \$30-\$50,000 per motorgrader per year.

NEW BUILDING

Road and Bridge department is in desperate need for a new building, based on efficiency and safety factors. Currently we cannot bring in our motorgraders with front or rear attachments to be worked on because they are too long. We have to take off those attachments or park them diagonally across 2 stalls to work on. If we do take off the attachments it only leaves us 2' between the back of the machine and the wall, while the front is less than 6" from the door. Dump trucks barely fit in as well do to their length. KDOT trucks dedicated to snow plowing cannot be brought in with plows on because the spreaders won't allow it.

A new building would also provide better electrical coverage since we have to use many electrical cords to achieve our work. Air line hoses are the same issue, being laid on the floor potentially providing for a tripping hazard as well.

Our current truck storage stalls only have an 8' opening so that we have to pull in mirrors to prevent them from being hit. We have numerous areas around the shop roof that leak. We only have 1 restroom each for sex and sometimes, during meetings, can cause quite the problem.

Another huge benefit with a new building would be the addition of a heated wash bay. During the winter equipment needed to be cleaned to be worked on and it provides a health and safety issue for people to be standing on ice and getting sprayed with freezing water at the same time. We would also be able to better maintain the mud, water and contaminants.

More dedicated areas for crews away from the offices would also prove more efficiency in that our current offices in the courthouse could be moved into this new building, thus providing more space in the courthouse for whatever needs there are. Offices and shop would provide for quicker and easier communication within the department. Dedicated conference rooms would allow for more meetings with updated electronic capabilities, without having to go to another venue. Offices for material testing and separation between general public with management (engineer, supt, and mechanics) would definitely provide safer and more efficient work. Considerably more storage could be provided as well. Lastly, a dedicated service area, with sunken work area, would decrease the time to do servicing and oil changes immensely.

The new building would also be able to house Emergency Management vehicles as well in 2 stalls, thus providing more local access as well as eliminating lease payment outside of town.

Road and Bridge would like to budget \$1,000,000 for this over the next 2 years, \$500,000 each year, to be able to build. We can handle the design and oversight in-house. We can build ½ on existing ground on North Coble and then move (temporarily) to the new part, tear down the existing building and then build the remaining portion.

SNOW AND ICE (SNICE)

An issue brought up every year, without budget, is whether the county should provide SNICE operations. Being centrally located with equipment, this brings up many issues to consider. KDOT has supplied a wealth of information that they have compiled on costs that they have from many years of doing this.

Road and Bridge tried treating the roads in the past with salt brine. This did not work well. Brine is a preventative operation to reduce ice buildup on the roads but is only beneficial if rain does not precede snow and ice. Rain washes off the brine and then is not effective against the freezing precipitation. Brine tank operations are expensive and would have to be remotely located for best result.

Spreading salt is also a very costly operation. Salt needs to be stored in moisture free environments to keep it from clumping together, preventing it from being able to be spread from the hoppers. Since equipment is centrally located it means all trucks (3) would have to go out and come back to Marion to replenish. This may mean that they would reach the extents of the routes and be out of material and have to dead head back to Marion.

Remote storage areas could be built to help with this issue. However, each location could cost \$50,000 or more and we would also need a loader with electricity for block heater to load the trucks. Depending on how many remote locations we could have we may not have enough loaders. Also, with 3 trucks we would have twice as many miles as KDOT does per truck, thus meaning it takes us twice as long to hit all the roads. This plan also assumes that we have no breakdowns with these aging trucks to complicate matters more, and we may have to run 24/7 to keep up with the treatments.

Lastly for SNICE is how to budget for “unknown” weather issues, as in how much snow/ice/freezing rain/wind will be with every storm. Each storm is fluid, in that conditions change hourly and you need to be responsive and reactive to it, thus creating more things to think about.

5-YEAR PLAN RECAP

Every item we have is controlled by budgets and available resources
Paved roads are in need of substantial work with limited resources
Gravel roads are in need of rock and rebuilding with limited resources
Most roads have base problems which cause more surface problems
Maintenance is being done but doesn't help in the long term
Dirt roads need attention but not highest priority
Crushed concrete will be a huge benefit on the roads
Bridges and Culverts are in large need of repair/replacement
Equipment is in need of maintenance and replacement
A Building is requested for safety and efficiency.
SNICE operations are very costly due to the size of the county
and conditions of the storm