

2015 AUGLAIZE COUNTY ENGINEER'S ANNUAL REPORT

By: Douglas Reinhart, P.E., P.S., County Engineer

To the Board of Auglaize County Commissioners: An annual report of the status of the county's roads and bridges is one of the mandates of the Ohio Revised Code to this office. It is important this report not only be provided to the County Commissioners but be shared with the citizens of Auglaize County so they can better track how their taxes on license plates and fuel are spent locally. The following is just a partial listing of the accomplishments of the highway and engineering department for 2015. Hopefully you have witnessed several of the projects outlined in the report and now you can attach a cost to that improvement.

I would first like to thank this department's employees for their dedication and skills. An engineer can develop all the programs and prepare concise plans, but unless he has the work force to complete those projects efficiently and professionally, they are not worth the paper they are drafted on. I would also wish to thank all those landowners throughout the county whose farm or yard we were working adjacent to or in. Their cooperation allowed us to perform our work, sometimes off the road right-of-way, which resulted with a much safer safety shoulders and flatter side slopes for the traveling public.

WEATHER IMPACTS BUDGET AND WORK SCHEDULE

The winter of 2014/15 resulted in record expenditures for materials used for snow/ice control. The 3,508 tons of salt/stone mixture applied during the 48 times the trucks were dispatched was the fifth highest total tonnage in the past 32 years but the second highest expenditure due to salt costing \$69.05/ton versus \$49.60 just the winter before.

Weather during the spring was not ideal for construction projects and then the rainfall during early summer brought that work to a complete halt. Our May, June and July rainfall exceeded 26" with 36" being the annual average for the entire year. I personally removed 18 ½" from my rain gauge at home from June 15th to July 15th. Our planned roadside and maintenance on the drainage ditches came to a complete halt. Fortunately the second half of the summer and the balance of 2015 provided excellent working conditions to help us "catch up" from prior work commitments and damage repairs resulting from the flooding.



(Photo L to R – Gary Kuck, Chief Deputy; Erica Preston, County Administrator; Seth Rohrbach, Mechanic) With the help of Gary Kuck and Erica Preston, the department received a \$ 32,082 grant from the Bureau of Workers Compensation for 75% of the purchase price of wireless mobile column lifts. These units replace a 1969 floor lift system.

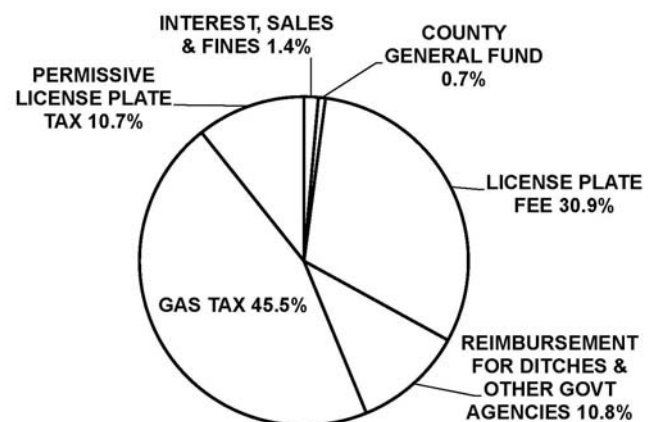


AUGLAIZE RIVER LOGJAM REMOVAL COMPLETED

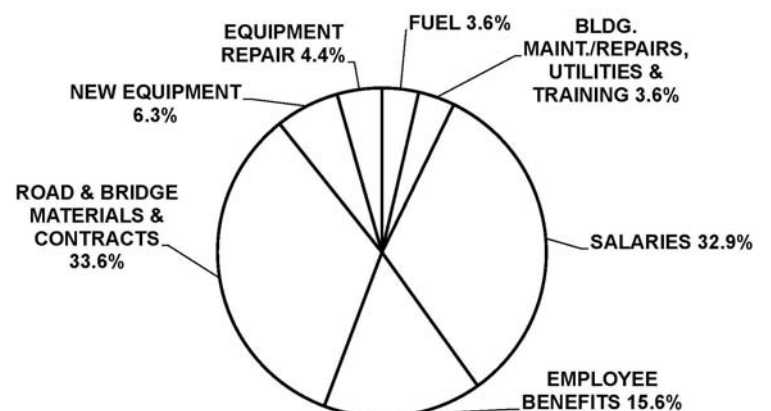
The removal of the logjams and debris from the 62 ½ mile Auglaize River/Two-Mile Creek project was completed in October. Along with 2,370 jams of various sizes, ranging from 2-3 trees in one location to the "mega" jams (above photo) have been removed along with the cutting of 4,100 severely leaning trees that were soon to fall into the stream. Due to the extremely low bid received for this work, the commissioners let a second bid for the removal of over 8,000 dead ash trees on the stream banks. As of the end of 2015, over 6,000 of the dead ash have been removed. By the fact the project went through the petition process, the river and Two-Mile Creek are now under a maintenance plan to address any future jams and debris removal.

2015 BUDGET

2015 RECEIPTS



2015 EXPENDITURES



BUDGET ITEMS TO NOTE

1. 2015 Revenue from Gas Tax and License Plate fees (87% of total income) has increased just 6% from that received in 2006. During that period asphalt has increased 64%, aggregate 95% and salt 60%.
2. According to the US Dept. of Labor's construction inflation calculator, the 2015 budget had a shortfall of \$812,000 when comparing the income and purchasing power of the 2006 budget.
3. The 0.7% income from the county general fund (your real estate taxes and sales tax) is dedicated to partially operate the Map Office only with no dollars being expended to roads or bridges.
4. One 2015 tandem truck with snow plow now costs \$161,600.

2015 ROADWAY IMPROVEMENTS

The barometer for how well this department's 350 mile highway system is being improved/maintained has been the number of miles resurfaced with hotmix for a particular year. During the decade of the 1990's resurfacing averaged 36 miles per year (under a 10-year rotation) due to increases in income through adjustments to license plate fees, gasoline taxes along with asphalt prices under \$25/ton. Income has stagnated for several years now since plate fees have not been increased since 1991 and the gas tax has not been adjusted in over a decade. During that period of time construction inflation for resurfacing has increased by 285% since 2003. As a result, only 7.36 miles of the 350 mile network of county maintained roadways were resurfaced with hotmix in 2015. That calculates to a 47 year rotation. The question is: Are we "losing" our roadways? My answer is: Not quite yet. But I don't know how much longer we can "maintain" the integrity of the roadways without a routine resurfacing, leveling and strengthening with hotmix.

As the balance of this report will outline, we are in maintenance mode at the current time in order to preserve the roadway surface through the chip/seal resurfacing, crack sealing, roadside drainage and pavement stabilization programs. My employees are tired of hearing me quote to them: "There are three things that will ruin a roadway and they are - - water, water and water." It is our challenge now to use all the above mentioned methods to maintain the surface of the pavement until dollars can be found to hotmix the roadway. 2015 paving costs amounted to \$67,700/mile for 1 1/4" of hotmix on a 20' wide roadway.



The streets in the Meadowbrook Subdivision west of Cridersville are "County" maintained. A method of sealing and providing a new wearing surface known as micro-surfacing was applied using a thin layer of liquid asphalt and sand (left photo). The treatment will not last as long as a hotmixed roadway but was used because: the thin layer did not fill the shallow curbing that existed and helped maintain the street drainage; cost was 55% of hotmix; no loose stone; a short cure time opened the streets to traffic quickly.

SNOW AND ICE CONTROL: Trucks were dispatched for 48 different snow and ice events beginning as early as November 17th and the final event being on March 27th. Crews applied 3,265 tons of a 1:1 mix of salt and #9 limestone. Added to the mix was 24,900 gallons of a blended beet juice/salt brine mixture which is used to assist in cutting packed snow and ice at temperatures well below freezing. Just the above listed material cost for the winter of 2014/15 was \$ 153,608 which is the second highest expenditure over the past 32 years. It was the 4th highest total of salt tonnage used over that period but because salt bids came in at \$69.05 per ton versus \$49.60 the prior year, the material costs for the winter was only exceeded by the 2007/08 winter. After adding in the overtime, fuel consumption and equipment wear, total expenditures exceeded \$250,000.

CHIP AND SEAL PROGRAM: This maintenance practice can extend the life of a pavement 8-10 years by applying a layer of liquid asphalt followed by a layer of #8 limestone. This application is then followed up by a second application of asphalt called a fog seal which further inhibits the penetration of water into the pavement. 18.3 miles of total pavement width was sealed and an additional 31.0 miles was "strip-sealed" where just a 4 1/2' strip along each edge was treated. A total of 162,366 gallons of liquid asphalt and 5,490 tons of stone were applied in the program with a material cost of \$332,823. The follow up fog seal application used 22,932 gallons of liquid asphalt and had a material cost of \$30,500. The material cost to full seal followed by a fog seal amounts to \$ 11,903/mile while resurfacing with hotmix now amounts to \$ 67,000 per mile. County crews were hired by the township trustees to seal an additional 14.7 miles of township roads throughout the county.

CRACK-SEALING: Another tool to the prevention of water entering the asphalt surface is the application of a polymerized asphalt that is heated to over 300° and squeegeed into the cracks after they have been blown clean of debris with an air compressor. This is a very labor intensive program but yields outstanding long term benefits. During 2015 crews applied a total of 10,550# at a material cost of \$ 4,853.

PAVEMENT STABILIZATION: A "dura-patcher" is a unit that has a 250 gallon tank that heats liquid asphalt to 150° and then adds #8 limestone as it is sprayed out of the wand. It is best on areas of severely deteriorated pavements and potholes. In 2015 a total of 13,384 gallons of liquid asphalt and 446 tons of stone were applied throughout the county.



The above photo is a concrete storm-water basin cast by county crews showing multiple drainage tile hookups. As an ongoing program to improve drainage within the road right-of-ways, in 2015 employees installed 628 feet of reinforced concrete pipe, 11,500 feet of smooth walled polyethylene tile and 55 new concrete catch basins.



Koop Creek travels extremely close to and parallel to CR#66A just south of SR#219 and had severely eroded the stream bank near the edge of the pavement. Crews worked with nearby farmers who had demolished several concrete silos by hauling the broken concrete to this site to reconstruct the eroded bank (above photo) and provide a wider safety shoulder for CR#66A. Rip-rap from a stone quarry would have cost \$18/ton.



4.15 miles of Hardin Pike (above) received a hotmix overlay for \$ 282,638. 3.21 miles of CR#66A south of St. Marys was also resurfaced for \$ 215,651.



The Washington Township Trustees hired county crews to widen and provide safety shoulders on Kettlersville Road south of SR#219. The dirt needed for the widening came from a nearby pond excavation.

2015 BRIDGE AND CULVERT IMPROVEMENTS



Our first bridge project (above) for 2015 was a rehabilitation of a 40-year old structure on Buffenbarger Road in Goshen Township which began the third week of March. The existing abutments were re-capped, new concrete floor beams were placed (manufactured by county crews in January). By the fact the opening had a very low profile, maintaining a normal rip-rap bottom was virtually impossible. Instead of using large aggregate, a concrete parabolic shaped floor was poured to stabilize the waterway under the structure.



The bridge on Santa Fe Line Road north of Fairmont Road was fully reconstructed using 31' long county manufactured precast concrete floor beams. Existing abutments were nearly a century old and had structural issues. A hydraulic demolition hammer was used to remove the walls which were then used for erosion control along the stream. The new abutments rest on a series of 10" steel piling driven an average of 25 feet below the flow-line of the stream.



One of the most critical steps in completing a bridge improvement is the waterproofing of the deck. Any county engineer will tell you that the intrusion of water and salt into the surface of a bridge deck will cause the ultimate deterioration of the concrete and reinforcing steel. The life span of a bridge can easily be shortened by decades if not waterproofed properly. The above photo shows the crew installing a much thicker membrane than used in the past anticipating even more longevity for the bridge.

As we end 2015, none of the 343 bridges under this departments jurisdiction have load limit restrictions for school buses, fire and rescue equipment or farm to market traffic. Two of the structures (long span river bridges) are starting to exhibit some structural problems and those are being programed for state and federal aid for replacement in the near future. All of the bridges/culverts replaced or rehabilitated in this report were done so with County Highway Department employees and no contracts were let in 2015. During the winter of 2014/15, between snow events, the bridge crew cast bridge components for the projects listed below. Over 400 cubic yards of concrete and 45 tons of reinforcing steel was used in the casting of the concrete floor beams, three-sided boxes, footers and headwalls for the 2015 program. Over the past 10 years, we have formed, poured and installed 37 three-sided concrete boxes and 42 sets of bridge beams.



Technology in the world of surveying has vastly improved since I began my career at this office in the 1970's. Then, a three-person crew was needed to operate the transit and 300' steel tape in order to obtain initial survey data prior to design or staking out a road, bridge or drainage improvement for construction. There was always a potential for errors resulting from inclement weather conditions and the fact all data was hand recorded. In 2015 a "Robotic Total Station" was purchased which has reduced the survey crew to one person. The unit

uses laser technology which will track and follow the person holding the prism rod. The total station stores the data which then can be downloaded into a computer in the office for the design of the project. Once the project is designed you have the ability to store essential project points from the computed design and stake out those points at the project site with accuracy within 1/4" and not only locate the points at a specific location on the face of the earth, but also at the correct elevation. The above photo shows County Bridge Engineer Andrew Baumer staking the exact location and elevation of the top of the bridge abutment about to be poured on the Maier Barber Road bridge.

2015 STRUCTURES REHABILITATED/REPLACED

<u>Location/Road</u>	<u>Description/Span/Length</u>	<u>Cost</u>
<u>COUNTY MANUFACTURED CONCRETE BEAMS</u>		
Buffenbarger Road	Replaced 25' span deck, rehab walls, pour floor	\$ 32,298.
Santa Fe Line Road	Complete replacement 31' span x 27' wide deck	\$ 89,201.
Rapp Road	31' span, replaced deck only, widened to 27'	\$ 31,965.
Maier Barber Road	Complete replacement, 32' span x 27' wide deck	\$ 74,066.
St. Marys River Road	Replaced outside beam due to accident, 31' span	\$ 7,477.
<u>COUNTY MANUFACTURED THREE-SIDED CONCRETE BOX</u>		
CR# 25A	80 lineal feet of 16' span x 7' high concrete box	\$ 81,334.
<u>PRESTREESED CONCRETE BOX BEAMS (PURCHASED)</u>		
Bay Road	Replaced 62' span deck and rehabilitated abutments	\$145,689
<u>BRIDGE DECK REHABILITATION</u>		

Bridge Decks on Blank Pike, Winemiller, Schooler and Holtkamp Roads were rehabilitated with new waterproofing membranes and resurfaced for \$ 34,281.



A short span bridge on CR#25A just south of Wapakoneta was replaced using 80 lineal feet of three-sided box with an opening of 16' wide x 7' high legs. By the fact this structure is near the entrance of Wapakoneta's Industrial Park, the design with higher strength concrete and additional reinforcing steel resulting in a carrying capacity of 500,000# in preparation for a possible "superload" being brought into the park. The photo to the left shows all 20 sections set on concrete footers also designed for the heavier loadings.

ADAMS DITCH UNDER CONSTRUCTION



The Adams Ditch is located three miles northeast of Wapakoneta and begins at Interstate 75 and flows southeasterly through Golden Bridge road and then east to the Auglaize River. The \$ 199,552 project includes: movement of 23,000 cubic yards of dirt to construct 4,050 feet of open channel which replaces a deteriorated century old subsurface tile; 4,205 feet of subsurface tile drainage that abandons a second 110 year old tile main; 1,040 tons of rip-rap for erosion control along with seeding and fertilizing all disturbed areas. The above photo is the open ditch construction beginning at the Auglaize River. The below photo is the finished channel seen from Golden Bridge Road looking east. This section was completed in the fall and in time to provide excellent seeding conditions. The portion from Golden Bridge to Interstate 75 will be completed in 2016 as weather permits. All surveying, design, assessments, public hearings and construction inspection was completed by Kevin Schnell, P.E., P.S., Assistant County Engineer.



John Jauert, P.S. (photo above) retired in 2015 after serving 42 dedicated years with the Auglaize County Engineer's Office. John began his career in 1973 after graduating from Owens Technical College. In 1984 he passed his state board exam and received his Professional Surveying License. Along with his numerous surveying duties with the department, John was instrumental in the monumentation of the county's original section corners. He also was in charge of coordinating road and drainage construction projects with the County's backhoes and excavators. For the past four decades John's skill and dedication has been witnessed throughout Auglaize County.

NEW FACES AT THE ENGINEER'S OFFICE

Along with the retirement of John Jauert, this office has lost both road and bridge superintendents and bridge engineer in the past 12 months to retirement. These four gentlemen logged in a total of 156 years with the department. Their expertise and knowledge will be missed but I am confident that the men shown below have excellent backgrounds and will step up and move this department forward for many years to come.



Ross Wuebker, above left, has a degree in civil engineering from the University of Toledo and began service with the department in June of 2015. Ross's duties will include the daily coordination of the backhoe crews and excavators on the county's 350 mile highway system and over 300 miles of maintenance ditches. Andrew Baumer, upper right, is the County's Bridge Engineer and has a civil engineering degree from the Ohio Northern University. His duties include the annual inspection and reporting of the county's 343 bridges along with the surveying, design and construction inspection of all new bridges and major culverts.



Mike Bowersock, upper left, has been with the department since 1990 and has taken over the position of Road Superintendent. Mike's past experience on every road crew and operation of virtually every piece of equipment has provided him the knowledge and skills for the job. Kevin Snider, upper right, has been with Auglaize County for 13 years and is the new Asst. Road Supt. and has a past history of working on multiple crews and operated numerous pieces of equipment.



Toby Lee, upper right, has taken the position of Bridge Superintendent and has been with the department for 12 years. Toby formerly served as the Asst. Bridge Supt. and has been a member of the bridge crew for several years. He has an excellent ability to overcome unknown "challenges" during construction of a bridge and is striving to make the operations even more efficient. Jesse Hein, upper left, is the county's new Asst. Bridge Supt. and has been with the department for just four years but brings with him an excellent knowledge of construction methods of forming and placing concrete.