

2012 AUGLAIZE COUNTY ENGINEER'S ANNUAL REPORT

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One of the many mandates of the Ohio Revised Code that an Ohio County Engineer has to adhere to is the publishing of an annual report to the Commissioners outlining the general condition of the roads and bridges in their county. I feel it's important this report be compiled regardless of the mandate for the following reasons: The taxpayers of Auglaize County need to see where and how their tax dollars are being spent; they can associate a cost to the improvements they have witnessed as they travel the county roadways; each report sets a benchmark for this department's achievements so we can strive to be more efficient and statistically out perform prior years performances. Special "THANKS" to all my employees for their efforts during 2012 and making me look good once again. We have a very skilled workforce with an excellent work ethic. Thanks also to all the landowners who owned ground adjacent to our projects. Their cooperation allowing us to use their property (many times outside the road right-of-way), aided in completing of our goals safely and efficiently.

CONSTRUCTION INFLATION ERASES WINTER SAVINGS

After experiencing one of the coldest winters (2010-11) in recent years, the winter of 2011-12 was undoubtedly one of the mildest. Only 530 tons of pure salt was needed for snow and ice control over the 350 mile county system while our nine year average has been 1,470 tons. Trucks were dispatched just 21 times last winter versus 53 times the winter before. The savings from the lower salt and fuel consumption, along with the reduced overtime, the winter impact to the budget was nearly \$100,000 less than the prior season and was earmarked for additional road and bridge improvements. Bids received for liquid asphalt for the seal program saw an increase of \$0.18/gallon times the 121,070 gallons applied resulted in a cost increase of \$21,792. Hotmix prices for the 16 mile paving program increased by \$5.40/ton, times the 14,213 tons applied resulted in a \$76,750 impact. The savings realized by the mild winter was consumed by the 2012 asphalt construction inflation and all the potential "extra" road, bridge and safety projects had to be reluctantly tabled.



For the past several years this department has been "going green" by using recycled asphalt and concrete on roadway and drainage improvements. Upper left photo shows county crews reconstructing a portion of Deep Cut Road at the Mercer County line. Two sharp curves with a 20' wide pavement was realigned creating two 45 MPH curves with a 24' pavement width. To construct the base a milling machine owned by Van Wert County was used to grind the existing base, move that material into the new alignment and then add 400 tons of asphalt grindings which were a residual from other road improvements. Our cost was less than \$2/ton for the milled asphalt versus \$65/ton for new hotmix. Upper right photo depicts our excavator on the permanent maintenance Heidt ditch south of St. Marys. Recycled concrete from the demolition of silos, building foundations and sidewalks is being used to control ditch bank erosion. Rip-Rap purchased from the stone quarries costs in excess of \$15/ton for the materials only.

HIGHWAY DEPARTMENT BUDGET DECLINING

The pie chart to the right shows the combined income from license plate fees and gasoline tax amounts to 74% of the 2012 total and is less than the dollars received from those accounts in 2006. The revenue alone from the Gas Tax fund is \$106,000 less than what was realized in 2007, when gasoline averaged \$1.94/gallon (Jan.07). During that same period of time, construction inflation for asphalt, steel and concrete drainage pipe has increased by 58%. What you could purchase in 2006 for \$100 now costs this department \$158. The last time a license plate fee was increased for a road/bridge improvement in Auglaize County was 1991. The last time the gas tax was increased, you could purchase fuel for \$ 1.73/gal (Jan.05). The resurfacing of the 350 mile county system has and will see a major impact. The ability to repair/replace long span bridges will be limited to those structures that can compete for limited federal funds.

A reasonable question to ask is: What is this department doing to better "stretch" the funds they have?

A. The workforce is 10% below the number employed 30 years ago.

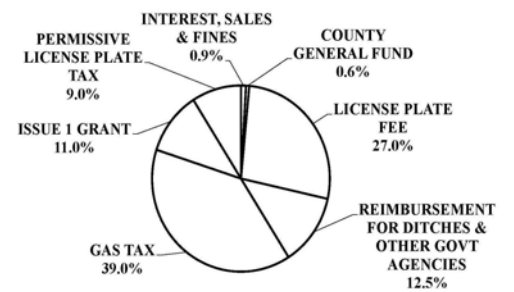
B. Improvements are completed using county forces and not contracted out (Ohio Law restricts the amount of work a county can perform with their own forces).

C. Dramatic savings have been realized using recycled construction materials.

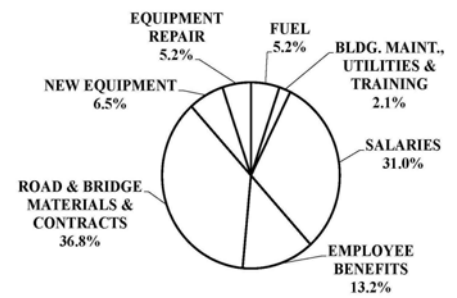
D. County manpower/equipment is being used to make infrastructure improvements for other governmental agencies to help subsidize the budget (12.5% of the 2012 income) and improve the efficiency of the department (see examples on pages 2 & 3).

2012 BUDGET

2012 RECEIPTS



2012 EXPENDITURES



HOW MUCH OF AN INDIVIDUAL'S INCOME GOES TO THE AUGLAIZE COUNTY HIGHWAY DEPARTMENT?

Real Estate Taxes: \$0.00

Sales Taxes: \$0.00

State and Federal Income Taxes: \$0.00

Annual License Plate Fees: Of the \$49.50 charged annually for a car, \$34. is earmarked to this highway department, municipalities and townships (The State Highway Patrol receives \$11). The balance is administrative fees for the issuance, making and tracking of registrations.

Gasoline Taxes: If you purchase \$60 worth of gasoline for your vehicle at \$3.60/gallon, just over 1/2 of a penny will eventually go into this department's coffers for that entire tank of fuel.



Due to declining revenues, an increased emphasis is being placed on preventive maintenance. During 2012 crews placed 38,550# of polymerized crack sealant (above) on 23 lane miles of county highway.

As the price of hotmix asphalt continues to escalate (270% over the past 10 years), preventive maintenance such as crack sealing, strip sealing and the “chip and seal” over the entire roadway has become commonplace in order to maintain the integrity of the pavement. As the surface ages, oxidizes, becomes brittle and cracked, water penetrates causing potholes and eventual failures.



An additional application of a light application of liquid asphalt known as a “fog seal” was applied to five miles of newly full sealed roads. The results were: Reduction of dust and loose stone; quieter ride; additional layer of liquid to seal the pavement, darken pavement to better accentuate the centerline stripe and aid in the melting of snow and ice in the winter. The results of this treatment have been excellent and appears to be another cost effective measure to increase the longevity of our roadways.

ADDITIONAL INCOME GENERATED

As shown on the pie chart on page one, 12.5% of the 2012 income was generated by the highway department being reimbursed for using our forces and equipment to replace infrastructure projects for other governmental agencies in the county. During 2012 county crews completed work for all 14 townships, City of St. Marys, several of the villages, and 200+ miles of maintenance ditches. Without this extra income, our ability to pay for safety and maintenance upgrades would be severely restricted. Shown below are just a few of those projects completed for other agencies.

2012 RESURFACING PROGRAM

<u>Road Name</u>	<u>Length</u>	<u>Location</u>	<u>Tons/Hotmix</u>	<u>Cost</u>
Barber Werner	1.1 Miles	Mercer Line to SR# 197	886	\$ 68,760
Salem Noble	1.0	Maier Baber to SR# 116	783	\$ 60,850
66A	2.3	Schillinger to SR# 66	1,831	\$141,980
Lock Two	1.6	East Shelby to Canal	1,295	\$100,740
Canal	0.5	1 st St. Minster to Shelby Co. Line	401	\$ 30,930
Wuebker	2.0	East Shelby to SR# 66	1,626	\$126,020
Aqueduct	2.1	Plattner to Greenville Rd.	1,761	\$136,290
Villa Nova Blvd. & Westway	0.3	Villa Nova Subdivision	266	\$ 20,420
Wapak Fisher	3.2	SR# 33 to Townline Lima	2,554	\$198,730
Buckland Holden	1.9	25A to Townline Lima	1,518	\$118,360
Buckland River	1.7	Infirmary to SR# 197	1,362	\$104,850
TOTALS	17.7 MILES		14,283 TONS	\$1,107,930

The 17.7 miles of resurfacing was only made possible through a \$657,000 Grant through the Ohio Public Works Commission. Unfortunately, this grant is only available to the County every four years due to the infrastructure needs of the other 22 governmental agencies within Auglaize County. Without the grant, only 7 miles of the 350 mile network would have been resurfaced in 2012 which calculates to a 50-year rotation. It now costs \$61,000 to pave a 20’ wide roadway with 1 ¼” of hotmix. \$100 worth of asphalt in 2003 now costs \$270.

2012 ROADWAY MAINTENANCE IMPROVEMENTS

Snow and Ice Control: As stated on the first page, an extremely mild winter resulted in the application of just 530 tons of pure salt (1,590 tons of 1:2 salt/sand mix) during the 21 times the trucks were dispatched. 4,800 gallons of a beet juice/salt brine mixture was added to the salt/sand for a nominal total cost of just \$1,918 resulting in a 25% reduction of the application rate per mile for the salt/stone.

Chip & Seal: The 14.1 miles of County Roads that were full sealed and 22.6 miles of strip sealing consumed 121,070 gallons of liquid asphalt and 3,544 tons of #8 limestone. To seal the cracks and provide a new wearing surface, the material cost per mile of full seal amounted to \$10,493 dollars versus the \$61,000 cost/mile for paving. The material cost for the five mile fog seal application amounted to \$1,747/mile.

Roadside Drainage: As a result of the mild winter, crews were able to concentrate on the replacement of century old storm sewers within the road right-of-way as early as January and February. At 32 locations on county and township roads, deteriorated culverts through the roadway were replaced using 908 feet of reinforced concrete pipe. Failed clay tile running parallel to the roadway was replaced using 12,220 feet of smooth walled polyethylene plastic pipe along with the installation of 66 new catch basins. For the past 17 years, this department has replaced an average of over two miles of storm sewer per year. Since these sewers drain not only the roadways, but homes and adjacent ag ground, special thanks goes to those landowners who have assisted in these improvements by purchasing much of the pipe we have installed.

Ditch Maintenance Program: With the passage of the Auglaize River/Two Mile Creek logjam project, along with multiple SWCD storm sewer projects, 2012 saw the total mileage of petitioned maintenance ditches we are responsible for far exceeded the 300 mile mark. At the end of 2012, the highway department’s responsibilities include maintaining: 99.8 miles of subsurface tile mains; 168.2 miles of open channels; 7.0 miles of waterways and 59.5 miles of open channels for logjams only, for a total of 334.5 miles. The staff tracks costs to each of the 280 petitioned improvements which are billed separately and not an obligation to all the citizens of Auglaize County. This extra workload keeps the crews and equipment busy twelve months a year.



County crews used 507 tons of milled asphalt to widen ½ mile of the Mercer Line (above) by three feet and provide safety shoulders.



The Village of New Bremen reimbursed the County for the replacement of 600 feet of a century old 18” diameter storm sewer through the park area with 24” smooth walled plastic pipe (above photo). Crews also reshaped the parallel surface drain.



The Logan Township Trustees hired County crews to extend Kossuth Loop Road using 820 tons of milled asphalt grindings.



To gain access to several acres of farmground at the Neil Armstrong Airport, the County Commissioners reimbursed our department for replacing an antiquated farm bridge with a “drive-through” crossing (above) using 500 tons of various gradations of stone.

2012 STRUCTURES REPLACED/REHABILITATED



One of the major bridge projects undertaken by County forces during 2012 was the rehabilitation of the bridge on the St. Marys Kossuth Road over Six Mile Creek. This was the only bridge out of the 347 under our jurisdiction that had load limit restrictions of under 20 tons which restricted schools buses, fire trucks and farm to market traffic. New County manufactured concrete beams were used (photo above) to replace a badly deteriorated deck. Since this roadway had been subject to constant postings due to flooding from Six Mile Creek, a County manufactured three-sided box was also installed (below photo) adjacent to the bridge to create extra capacity and alleviate some of the persistent flooding.



In order to generate more funds for the department, the bridge crew assisted with petition of the Miami & Erie Canal in Minster. The Phase II portion of this project ran from 7th Street north to SR# 119. This portion had a 25' unmaintainable bottom width and nearly vertical banks. As contractors brought in over 25,000 cubic yards of dirt from other construction projects, County crews leveled the material to create a maintainable cross-section (above photo) and extended the multiple storm sewers discharging into the Canal. The Highway Department was reimbursed for all the labor, materials and equipment used out of the petition's construction account. When completed, 1 ½ miles of the Canal will then be under the permanent maintenance plan.

<u>Location (Road)</u>	<u>Description/Span/Length</u>	<u>Cost</u>
COUNTY MANUFACTURED BEAMS		
Barber Werner @ Canal	Replaced 27' span & widened deck	\$ 21,306
St. Marys Kossuth @ Six Mile	Replaced Two 30' Long Spans & widened deck	\$ 63,137
COUNTY MANUFACTURED 3-SIDED BOXES		
Koenig Rd. North of SR#33	52 feet of 14' Span x 7' Rise Box	\$ 39,444
Allen Union Wayne	36 feet of 14' Span x 5' Rise Box	\$ 29,228
St. Marys Kossuth @ Six Mile	48 feet of 14' Span x 7' Rise Box	\$ 33,873
LARGE DIAMETER PIPE/CULVERTS		
Fairmont Road East of Valley CR# 33A	88 feet of 72" diameter reinforced concrete pipe Rehabilitated and extended 8 concrete culverts	\$ 36,820 \$ 27,279
CR# 33A West of Moulton	72 feet of 60" diameter reinforced concrete pipe	\$ 15,702
OTHER PROJECTS		
Townline Lima South/ Blackhoof Rehabilitated and waterproofed 63' span deck		\$ 14,675
Constructed abutments for walk bridge @ KC Geiger Park in St. Marys		\$ 17,774*

(* Labor and equipment only. All materials were paid for by the City of St. Marys)

The Ohio Revised Code defines a bridge as being any structure with an opening of over ten feet. Structures smaller than this are defined as culverts. The County is responsible for all bridges on the County and Township system of highways which amounts to 347 in Auglaize County. This ranks us 6th statewide of having the most number of bridges a county is responsible for. Annually, Dan Bennett, P.E., P.S., this County's Bridge Engineer annually inspects each of these structures, analyzes and rates over 50 different parameters for each bridge, makes a detailed report that I review and forward the results to ODOT as a part of a statewide database.

When I became County Engineer in 1984, this county had 46 bridges posted prohibiting school buses, fire trucks and farm to market traffic. As we end 2012, none are currently posted. The chart below is taken from ODOT's database and outlines the status of Auglaize County's bridges. The one structure rated "poor" is planned for replacement with federal funds in 2014 and the other 9 structures rated "fair" are being addressed as local, state and federal funds are available. I attribute our manufacturing of bridge beams & boxes, and the ingenuity and skills of the bridge crew as the reason behind those statistics. To date, 166 sets of bridge beams have been cast and 66 three-sided box installations have been completed since this program began.

COUNTY AND TOWNSHIP BRIDGES BY SUFFICIENCY RATING

(Each bridge is rated from 0-100 based upon condition and annual inspection)

Number of Bridges	% of total Bridges	Sufficiency Rating
225	64.8%	EXCELLENT (90-100)
112	32.3%	GOOD (70-90)
9	2.6%	FAIR (50-70)
1	0.3%	POOR (0-50)



The left photo is the County manufactured 3-sided box installed on the Koenig Road one mile north of SR# 33 which replaced a multi-plate steel culvert installed in the early 1960's. 50+ year old steel structures are now being targeted for replacement due to the severe deterioration occurring at the floor section. Since 1997, when we began the program of casting various dimensioned boxes during the winter months between snow and ice events, a total of 67 installations have been completed. The photo shows the precast wing walls setting on top of the box prior to their placement and backfill.

As stated on the first page, in order to increase income to compensate for falling fuel and plate revenues, this department has increased our efforts to work with the other governmental agencies in Auglaize County. Not only does it subsidize our income, we more efficiently utilize our manpower and equipment and provide a quality job at a cheaper price for that municipality or township. This past summer, for the City of St. Marys, the bridge crew constructed abutments (right photo) for a walk bridge over the canal to access a soccer field at the K.C. Geiger Park.



SNOW AND ICE CONTROL

As I looked back over the past 30 years, the equipment, storage facilities, technology, methods and materials used to combat snow and ice on the 350 mile Auglaize County Highway system has significantly changed. When salt was under \$20/ton and the budget seemed to have adequate funding, drivers would “estimate” the amount of salt and sand needed to meet the challenge. In recent years salt has exceeded \$70/ton and revenues are decreasing. Fortunately, snow/ice control has evolved into more of a science to make our applications more efficient. However, no matter how well we may feel we are prepared, unless the meteorologists are accurate with their predictions of an upcoming event, our department can be made to look very foolish.



1. Prior to 1984 the top of all the plows were horizontal to the blade. They would clear the snow from the pavement but roll it laterally into the sideditches. After just a couple of snowfalls, the sideditches were full with no place to deposit a new snowfall. Front end loaders were constantly dispatched to pick up the snow in the sideditches and deposit it over the fences. Flair type plows (photo above) were purchased as trucks were replaced which “launch” the snow off the right-of-way, keeping the roadways open after multiple events and lessening the need for loaders.



2. Before the current salt shed was built in 1996, the storage facilities amounted to no more than a shed with the capacity of 250 tons of salt, thus relying on trucking companies to keep us in supply. The mix pile was outside and subject to the elements. The 1996 structure (upper photo) has the capacity to hold 800 tons of pure salt and 2,000 tons of a 1:1 salt/sand blend.

3. Prior to the construction of the new salt shed, “blending” of the salt and sand was no more than spreading loader buckets of the two materials on the ground and then as they were scooped up, that was considered blended. Even though the “blended” material was applied to a roadway, it may not have had an even gradation of salt in the mix and motorists would encounter patches of ice. This problem was solved when two



hoppers (above photo) and an elevator system was installed to the new building. The bin to the left is loaded with pure salt and the other with sand. The openings at the bottom are specifically adjusted to discharge each material onto a belt at whatever blend ratio’s desired.

This material is then lifted and discharged into the middle of the mix pile inside the building thus producing an even blend of the salt and sand, thus assuring the drivers, and the traveling public, that salt is continually being applied every foot of the application.



4. The above photo is the quality control unit installed in each truck that calibrates the amount of material discharged from the spreader. Prior to having these controls, settings for the auger and spreaders remained relatively constant for each truck and the speed of the truck was not taken into account. With fixed controls, a truck plowing and spreading material at 15MPH during a heavy snow would be applying 25% more material than the same truck traveling 20MPH during a light snow. These units control the augers and spreaders and automatically adjusts the rates based upon the ground speed. If we wish set the application rate at 700# of material per mile, we can do so with quite a bit of accuracy. Within two years, the cost of these units were paid for through savings of material and are interchangeable when a new truck is purchased.

5. One of the latest tools to be implemented is the addition of a liquid by-product of making sugar from sugar beets. When this beet juice derivative is added to the salt/sand mixture, more effective results of cutting



packed snow and ice during prolonged temperature drops are realized. Salt at 30° can melt 46# of ice. Salt at 20° melts just 8# of ice and below 15°, salt has almost no effect at all. Beet juice, when mixed with a salt brine solution, has a freeze point as low as 10 below zero. We have also found that we were able to reduce our overall rate of application of salt/sand from 700# per mile to 500# per mile with better results. Early numbers show that with the reduction in salt/sand, then adding the cost of the beet juice provides us an overall cost reduction in materials of 20%. The below photo shows the storage containers used for blending of the beet juice and salt brine.

EMPLOYEE RECOGNITION

This report over the past 29 years has touted the accomplishments the public witnesses in our road, bridge and engineering crews. There are three “unsung heroes” at the garage that have received very little



recognition but are absolutely crucial to the success of this department. The three mechanics at the county garage are (LtoR), Denny Lhamon, Howard Bair and Seth Rohrbach. Our fleet of trucks travel over 200,000 miles annually and 60% are in excess of 10 years old. The sum total of all odometer readings is in excess of 6.6 million miles. The hour meter readings on the construction equipment totals over 234,000 hours. When a snow plow truck goes “down”, then there are 20+ miles of roadway not being attended to. During a construction project, all work comes to a grinding halt when that critical piece of equipment is not functioning properly and all the pre-planning and efficiency goes “out the door”. Special “THANKS” to these three men and all the past mechanics for all their behind-the-scenes efforts to keep us moving forward.



Annually several adjacent counties get together for some friendly snow plow competition and safety training. (Above photo, L to R, Tony Drexler, Kevin Snider, Mike Schmerge, Chad Kohlieser, Mike Bowersock). Kohlieser took 1st Place individual and the team of Snider, Schmerge, Kohlieser and Bowersock brought home 1st Place team event. Tony Drexler and his family spent several nights and weekends decorating one of our dump trucks and was awarded 1st Place Halloween Spirit award at the Wapakoneta Halloween parade.