

Guernsey County Engineer's

2022 Annual Report

By: Paul E. Sherry PE, PS

March 2023

My wife teaches high school science and she is constantly looking for methods to spark an interest in science for her students. Needless to say, there are always a variety of science papers and magazines around our house. Discover is one of her favorite magazines. One issue had photographs taken with telescopes and microscopes, the trick was to determine which lens was used, a far viewing telescope or a compact laboratory microscope. This was not as easy or obvious task as it sounds, because without good and relative benchmarks to compare, several objects have similar characteristics at extremely different scales. An example might be the Moon's surface versus a close up of a pancake, before syrup!

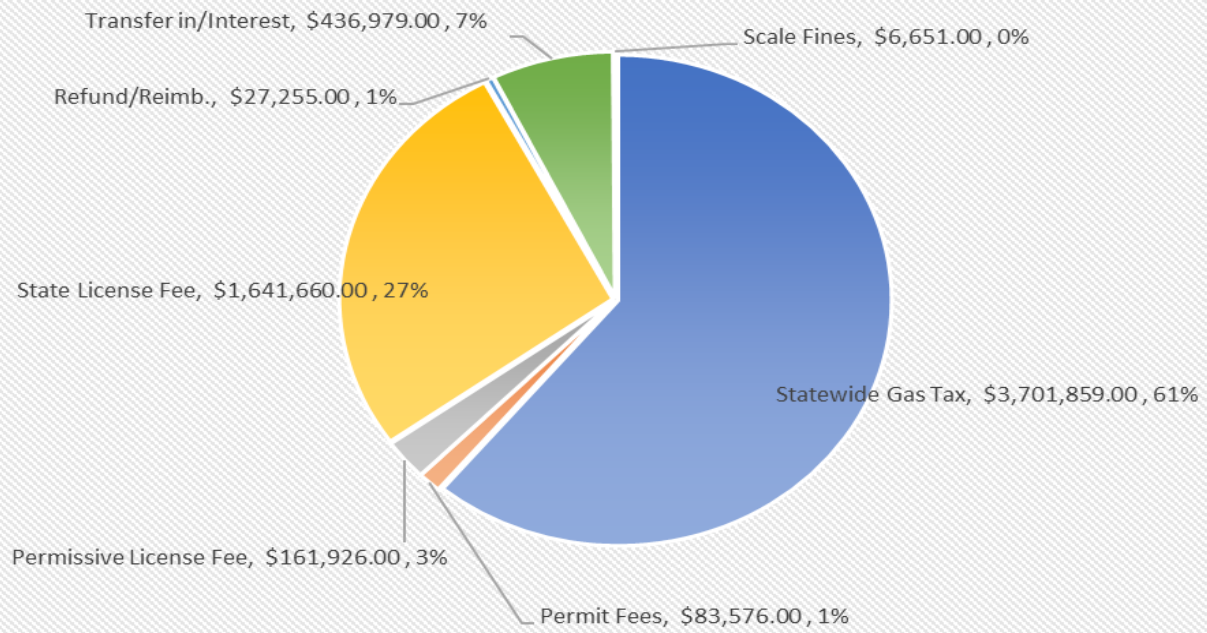
I use this example to help bring to scale the value of what services the Guernsey County Highway Department provides. Below you'll see a graph of our 2022 revenue and expenses. At one scale having \$6,000,000 to provide road maintenance may seem like a reasonable amount. But as different benchmarks are used to provide scale, other observations can be made. For example, when this revenue is compared to the miles of road (420) and number of bridges (314) that need to be cared for, the resulting number takes on a different scale.

Averaging this to our main infrastructure, leaves about \$8200 to maintain each mile of road and every bridge. This may seem reasonable and a good scale, until a different benchmark is used. This benchmark would be the current costs of repairing and resurfacing bridges and roads. Specifically, a typical asphalt road costs about \$200,000 per mile and the reconstruction of a 30-foot-long bridge was about \$325,000.

Yet another measurement that can be made is one of value for the services provided. Looking at our County wide condition of roads and bridges, when all the roads and bridges are measured, scored, and considered, we would be given a 'C' on our report card. Some roads and bridges get an 'A', others are in need of serious tutoring. Unfortunately, it is a cyclical battle; the time it takes to raise the grade on one road, another falls faster. However, the scale comes into play when the annual revenue is divided by the 38,287 residents in our County. The typical resident pays less than \$156 each year for unlimited use of our roads and bridges that are open 24/7. Many monthly services cost more than this.

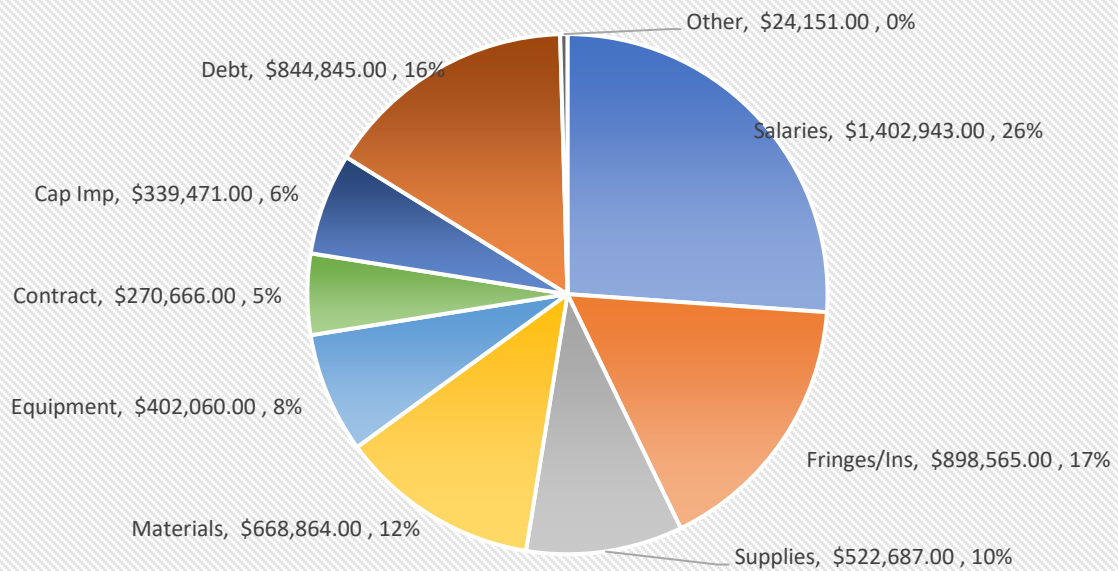
That \$156 per year will resurface about a piece of road about 38 feet long. That being the case we can finish a mile of road in about 138 years. If our community was a subdivision with homes on small lots with 60 feet of road frontage, the costs and revenue would balance out. But most of our beautiful County is rural in nature, low population with neighbors generously spaced, and residences measured by the acre and not the foot.

REVENUE



* We were fortunate to receive \$2,859.88 from the Amish Steering and Safety Committees to be used for the repair and maintenance on roads that have animal-drawn vehicles.

EXPENSES



2022 Year End Operations Report
Tony Warden Highway Superintendent

The Highway Department worked through another busy year in 2022. It seems as though the year passes very quickly. One project to the next and before we know it, we are preparing for winter again. We had a really good fall and got a lot of small projects taken care of. These projects seem to take up a lot of our time, but if we don't get to them, they become big issues. Winter just really got started around Christmas and reminded us how quick things can turn.

For our first major winter run, went very well, the time spent preparing for winter conditions paid off. We checked over all the equipment and stocked up on materials in preparation. All of this pays off when the weather turns bad.

Last spring was like most others with roads needing a lot of attention coming out of winter. Ditches needed to be opened up, potholes needed patched, and roads needed graded. We put the landplanes (drags) behind our 3-point hitch tractors to do some early grading when it is still too soft and wet for heavy grader work. They work very well in the spring and fall to shape and bring the stone up on our roads. The landplanes let us get on our county roads much sooner to start the repair process.

After the roads dry up and settle down, we get our graders on the road to do our heavy grading and crowning of the county roads. This takes 2 or 3 rounds of grading to get them in shape. Some require more than others, but we try to stay at it until these roads are shaped up before it gets too dry. Once we get to the dry months, we like to have all heavy grading done because it can stir up dust.

We were able to perform 12 miles of grader ditching on the following roads:

CR 82 Anderson Rd	1.5 miles
CR 84 Sugartree Rd	0.5 mile
CR 73 Grapevine Rd	4.75 miles
CR 870 Sligo Rd	4.75 miles
CR 878 Titus Rd	0.5 mile

Roadsides were all mowed 2 passes by a contractor two times this year. This worked out well as we have trouble keeping up with the mowing. Our crews did however mow up tight next to guardrails where the contractor can't get close enough. We also kept our boom mowers cutting road banks and trimming back trees along our county roads.

Our county crew made some modifications to our brine truck and ended up doing our own guardrail spraying this year. It will take some time, but I think for the first time out, it worked well. We hope to keep that going in 2023 with possibly doing 2 applications. This will save the department some money. 368,892 lineal feet of guardrail was sprayed in all.

County crews installed new culvert pipes under various roads, the following is a list of what was installed:

630 feet of 12"
390 feet of 18"
470 feet of 24"
160 feet of 36"
100 feet of 48"

Our county office responded to 139 calls from the public and dealt with the issues in the appropriate manner.

Finally, I believe this department did a good job meeting all of the ever-changing challenges with the amount of traffic, aging infrastructure, and equipment. Budget constraints are more challenging every year as the price of being in this business keeps going up and up while our (budget) income stays basically the same. Overall, we made good progress through 2022.

Goals for next year are basically the same as every year: Keep moving forward if only a little at a time. I would like to do more grader ditching and grader patching with hot mix.

2022 Year End Bridge Report
Gary E. Glasgow, Bridge Foreman

During 2022, The Bridge Crew performed total deck replacement of the bridges listed below. This work included upgraded and heavier beams and treated wood decks. The decks were then covered with physical barrier called Petro-Tec before being paved with asphalt. New drip edge, outriggers, and guardrail was installed to finish the replacement

- Anderson Road (CR82) in Madison Township, 3033872
- Oxford Road (CR49) in Oxford Township, 3030016

The following bridges had significant repairs as described:

- Tuscarawas Road (T383) in Wheeling Township, 3030075, received substantial improvements to the channel to protect the bridge abutment from being washed out. This included placing concrete slabs near the entrance and pouring concrete in areas washed out by storms.
- Murray Lane (T4306) in Jackson Township, 3034488, repairs included new asphalt aprons on each end to smooth approach that was damaged by storms.
- Anderson Road (CR82) in Madison Township, 3033687, the approaches were improved

by using our small grinder to smooth transitions to create a better vehicle ride.

- Yellow Water Road (T860) in Monroe Township, 3034286, had a total deck replacement performed with new oak planks.

The following were some minor repairs made throughout the County:

- Replace individual oak planks
- Repaired and replaced guardrail and rail ends were replaced at 19 locations
- Pothole and grading on an around the bridges
- Removal of debris from creek channels
- Several culvert repair and replacements
- Repaired small road slips at several locations

Construction Plans and Contracted Improvements

By Jeff McConaughy, Deputy Engineer

Our capital improvement projects for 2022 were limited to only three projects. We had our typical OPWC resurfacing project that finished up in the spring. After the resurfacing project, we bid out a chip seal project on CR 345 (Country Club Rd), and then bid out the FEMA Slip Repair project in late summer.

We completed the 2021 CR 346 & CR 831 Resurfacing project in the spring of 2023, and this included a 2.25" asphalt overlay of 2.2 miles of High Hill Rd (CR 346). The remaining 3.38 miles of High Hill Rd was completed in the fall of 2021. According to our records, High Hill Rd was resurfaced in 2003 so this resulted in several partial (1823 square yards (SY)) and full depth (848 SY) pavement repairs being completed before the overlay. There were several areas that had base failures so the pavement repairs were necessary in order to extend the life of the new overlay. In addition to the 2.2 miles of resurfacing, the whole 5.59 miles of High Hill Rd from Claysville Rd to Cambridge Corp limit received a compacted aggregate berm, raised pavement markings, rumble strip in the centerline, permanent centerline & edge line, and an asphalt rejuvenating agent. The rejuvenating agent was applied to the new surface to fill the micro voids left in the asphalt. This reduces water infiltration and restores the asphalt lost in the production which will extend the life of the pavement. OPWC grant contributed \$199,475 for this 2.2-mile corridor, and the County contributed \$314,830 making the total cost of the project to be \$514,305 or approximately \$17.85/sq. yd. NLS Paving was the contractor for this work.

After the resurfacing project was complete, we went into the pavement preservation mode. Country Club Rd (CR 345) was resurfaced in 2015 which made the pavement 7 years old. With on-going maintenance, we can extend the life of the pavement 5-8 years if we treat the surface at the right time. We decided to chip seal Country Club Rd from SR 821 to SR 209 which was approximately 2.09 miles. Before the chip seal surface was applied, the contractor performed a

few partial pavement repairs on the base failure areas (665 SY). These base failures would only continue to grow if they weren't corrected before the chip seal surface. After the repairs were complete, the chip seal surface was placed on the existing asphalt surface. The chip seal surface includes #8 limestone placed on an asphalt emulsion (CRS-2P). The chip seal will seal up any cracks in the existing asphalt, and keep the water out of the surface which will prolong the life of the pavement. A fog seal was then placed on the chip seal which will lock-in any loose stone and give it a fresh black surface. The corridor received permanent striping and raised pavement markings. This project was completed by Melway Paving Co. at the cost of \$130,642 or \$4.84/SY.

We also completed another pavement preservation treatment on two routes in the County. We crack sealed approximately 55,158 SY of pavement at a cost of \$27,579 or \$0.50/SY. The two routes included:

- 1) Vocational Rd from Byesville Rd to SR 209
- 2) College Hill Rd from Skyline Drive to SR 209. This will extend the life of the pavement 3-5 years. Strawser Construction Inc. performed this work in the summer of 2022.

In late summer, the County awarded Rosen Enterprises \$849,810 to complete three slip repairs funded 100% by FEMA grants. Part I included the Robins Rd slip repair located just east of Soggy Run Rd. This wall system (226') was made up of 36" diameter drilled shafts with precast concrete lagging. The steel beams in the drilled shafts were W24x162. The project also includes rebuilding the pavement. The wall system was completed in January 2023. The road repairs will be completed in spring/summer of 2023. This section will cost \$437,216.

Part II included the New Gottengen site #1 repair just east of Salem Rd. This wall system (115') was made up of 24" diameter drilled shafts with precast concrete lagging. The steel beams in the drilled shafts were W12x53 (much smaller than W24). The project also included the repairing the gravel road. This section is 100% completed, and cost \$104,172.

Part III includes the New Gottengen site #2 repair approximately 0.75 miles east of Salem Rd. This wall system (292') will be made up of alternating 36" diameter drilled shafts (king pile) and 30" diameter drilled shafts (plug pile). The king piles will have a W27x94 in the drilled shafts, and the plug piles will be completely filled with concrete (no steel). The gravel road will also be repaired as part of the project. This section will cost \$308,422, and be completed in 2023. Currently, there is a clearance issue with AEP Transmission and this work will be completed by the fall of 2023.

Equipment Needs

Over the last four years we have concentrated on improving the fleet of dump truck. These are used everyday and in every weather condition. Each truck fully dressed costs about \$200,000, but can last in excess of 20 years. Our current weighted age average is about a 2007, with two 2024's on order we should improve that statistic. The next area to concentrate on is replacement

of Road Grader(s), currently we run four with the years; 1990, 1993, 1997, and 2012. Fortunately, this type of equipment has not changed much over the years, but we are running into problem finding replacement parts for 30-year-old equipment. It is unlikely we will ever reach the goal of being fully paved. Sadly, several paved roads are likely to become gravel and that will solidify our need to have graders regularly operating. At \$300,000 each, that purchase must be planned out over time.

Even though we have outsourced some of our mowing, we still run 2-3 long arm mowers all year round. These specialty mowers need to cut brush and woody materials further from the edge of the road, at intersections, along the high banks, and over the bank, places a normal mower cannot reach. They do a great job, but are extremely slow. If we leave it to these mowers to do all of our mowing without additional support, the grass and brush will take over the county because it grows faster than we can cut. This can be seen on several roads, where, we have not been able to keep up and the roads are becoming closed in by trees, which makes a bigger problem. Which explains the need to add another long arm mower in the next year.

In Closing

It is my pleasure and honor to present this annual report of the Guernsey County Highway Department's activities for the past year. The report will cover the amount and sources of revenue as well as the corresponding expenditures. We will also take this opportunity to highlight several of our accomplishments and items to look forward to next year.

Our employees did a great job in performing a wide variety of tasks that keep the roads and bridges open and safe for travelers. It often feels as an effort in futility as more than half our roads are in a very difficult condition to maintain. Failing chip and seal is by far our greatest burden because these roads are subject to problems seen in both gravel and paved roads. In the coming year, we will continue to take look at which of these should be sealed and which should be ground back to gravel, removing old paving remnants which would allow for a consistent surface.

The impact from a long history deferred maintenance, caused by revenue not keeping up with inflation, is evident in the formerly chip sealed roads that have fallen into very poor condition. These roads generate most of our complaints and require a large amount of effort that impacts a relatively small number of travelers. Looking ahead to 2023, several of these roads will have a variety of treatments to improve service and lower maintenance issues.

I am thankful for the opportunity to serve you and look forward to continually improving the roads and bridges across our County.

In your service,
Paul E. Sherry, Guernsey County Engineer