

Recommendations to the POA BOD and Staff from the PSAC Paving Subcommittee
Revised 4-28-17 Final Revision for Presentation 5-2-17

Jacobs Engineering Group, Inc. delivered a Technical Memorandum to Tellico Village dated June 27, 2016 which stated the following items, which we agree with.

- Tellico Village streets are the most used asset of the Property Owner's Association in Tellico Village with the greatest expense to maintain.
- Overall, Tellico Village streets are in very good condition.
- The Village's street overlay program was halted due the economic downturn and no streets have been repaved since 2008 (2005 according to PW records, 2010 records show Sequoya overlaid, 2012 records show Tanasi was overlaid. Historical records are not recorded in one place for easy access so mistakes are easy to make).
- Pavement Management Program: Take it to the next level.
- Public Works must keep an eye out for new and improved products to extend the life of our streets.
- Look into a Geographical Information System to help pavement management.

Tellico Village's, PSAC Paving Subcommittee's, Engineer's Qualifications: These are the experts in asphalt paving and maintenance that we located for advice.

- Jon Hargett, President, (PRI) Pavement Restoration, Inc., Milan, Tennessee and Greg Ailshie, the manager of PRI's Knoxville Office (March 21, 2017). Ken, Charles, and Jeff met with Jon and Greg. Clayton, Ken, Charles, Jon and Greg drove Sequoyah Road, Chota Road, Tanasi, and many of the roads in Chatuga. Additional conversations and communications also provided information. Jon is a Civil Engineer with 10 years' experience building and maintaining asphalt roads with Tennessee Asphalt Company before starting his own Pavement Restoration company in 2006. He now has 11 years' experience in pavement restoration and maintenance and has had the annual maintenance contract for the Metro Nashville Public Works Department for the last 8 years.
- Donald Reid, Civil Engineer with 16 years' experience working for TDOT writing and directing their Pavement Management System, now the Assistant

Director of Public Works and Paving Manager, Metro Nashville for the past 14 years. Ken, Charles and Jeff drove to Nashville on March 29, 2017 and met Donald Reid and Ben Collier, Vice President of Collier Engineering, Brentwood, Tennessee. Both discussed the various methods of pavement preservation, products, etc.

- On April 4 and 5, Donald Reid and Tim Martin, Road Inspector for Collier Engineering, Nashville, Tn. drove to Tellico Village. Tim Martin has been the Lead Paving Inspector for Collier Engineering for 15 years and is the primary inspector for Nashville's Paving Crew. Over the evening of April 4 and morning of April 5, Charles or Ken, along with Clayton (April 5th), drove Donald and Tim over all of the neighborhoods, major roads and parking lots of Tellico Village except Kahite, due to distance and time limitations. Thereafter we all met with Jeff Gagley at which time Donald and Tim shared recommendations. Additional communications contained specific recommendations for the various roads, neighborhood roads and parking lots.

After discussions and actual inspections of the roads and parking lots in Tellico Village with the above individuals, the general consensus was:

- Tellico Village roads are generally in good condition.
- All stated they would **not** mill **Sequoyah Road** or any other roads in Tellico Village unless they were in distress with things such as major potholes, major alligator cracking or severe and major raveling on major portions of the roads. All said they did not observe these conditions on any of the roads in Tellico Village with the exception of some in Chota Shores and Chota Road from the TV Fire Station to Hwy 444. They identified some roads such as Toqua where section milling will be necessary. All also stated in neighborhoods with roads already at the top of personal driveways, it will be necessary to do narrow profile milling along the sides so that any needed overlay would match the personal driveway height or be slightly below the driveway.
- Jon Hargett and Greg Ailshie are of the belief that most of the damage on **Sequoyah Road** is the result of end of truck load imbalance of the material. In other words, each truck load of asphalt, would at the end of its load, be unconsolidated by the pavement machine because there wasn't

enough material for the machine to get thorough compaction of the asphalt. This is a contractor problem that could have been prevented with proper quality control, placement methods, and testing while paving.

- Various new products for roads and parking lots were discussed for pavement preservation and specific products were recommended based on the conditions of the roads. All were turned over to Jeff Gagley, Public Works Director.
- All stated the sliding or shoving of the pavement on **Chota Road** is the result of poor tack coating installation that bonds the layers of asphalt together. This again is a problem that could have been prevented by proper quality control during construction. We should have had a quality control inspector verify that the contractor correctly applied Blacklidge "Trackless Tack" coat and this shoving problem would have been eliminated. The road lasted 2 years instead of 15 years. We are repaving now for a cost of \$51K.
- The parking lots at Tanasi and the Yacht Club are failing after only 7 years instead of lasting 15 years and it appears to be the result of a lack of enough oil in the original mix. Donald Reid and Tim Martin both stated that the asphalt mix design was "bad". This could have been prevented by having the contractor submit his mix design before the job and by having a testing lab check the mix at the asphalt plant and at the job for verification of compliance. We are milling and repaving 8 years early at a cost of \$80,000 and \$115,000, TOTAL-- \$195,000.
- As far as the "neighborhood" roads north of Sequoyah that have not received an overlay, it is recommended they receive various preservation treatments before an overlay is necessary. They did not recommend overlaying now simply to add another inch of paving structure.
- All strongly suggest having an independent third party assist the Public Works Department in preparing proper specs for projects, have the project inspected as it is being done, have the products tested to ensure the product meets the specs, and have a testing lab do Quality Assurance Inspections during asphalt placement.

➤ PSAC Paving Subcommittee Recommendations:

1. Improve Our Request for Quotes (RFQ) and Bidding Procedures: Compare our Tellico Village Request for Quote and Specification for our recent repaving jobs and the City of Oak Ridge's RFQ and Specification for their repaving job last year: Do you think Tellico Village's documents measure up to the industry standard?

- Schedule a **Pre-Bid** site meeting to view and discuss the paving application to be done and obtain any recommendations from the qualified bidders as to how they would attack the problem.
- Produce a detailed **Scope of Work** for the job.
- Produce a detailed **Specification** for the paving or rejuvenation work to be done.
- Produce and use **One Standard Contract** for Tellico Village work so that all vendors will be on the same contract.
- Select bidders from a qualified **Vendor List** and **get 3 bids** at least
- Hold a formal **bid opening** with the bids tabulated and made public.
- Establish checks and balances to insure we **award the job to the Low Bidder** unless there is a problem that disqualifies their bid.
- **Test** the paving/sealing/rejuvenation to **verify** quality during construction. When we don't verify, we may not get our money's worth.
- **DO NOT MOVE FORWARD ON THE PARKING LOTS, CHOTA OR SEQUOYAH ROAD UNTIL AN INDEPENDENT 3 RD PARTY CAN BE HIRED TO SPECIFY AND INSPECT THESE PROJECTS.**

2. Vendor list should include a minimum of 5 qualified bidders for each project if possible so that we will definitely get at least 3 bids.

3. Improve Road Inventory, Score the Roads, and Prioritize our road repairs by this score. This should be a computerized **Pavement Management System**. There are vendors that will inventory and score our roads and make recommendations as to the most cost effective way to repair them. We recommend using them. "Take it to the next level per Jacobs report."

4. We recommend seeking several vendors of **GIS** (Geographical Information System) systems and have them make presentations and estimates of what this will cost to implement. A GIS will help us locate and schedule all of our PW Maintenance of roads, sewer, water, and buildings. It will keep data records for past, present and future use in forecasting budget expenses more accurately. It will provide a system that can be passed on to remaining employees when long term employees retire.

5. Reduce our pavement preservation cycle to no more years than the manufacturer's suggested time interval. If a manufacturer says his product will protect our roads for 3-5 years, then we **MUST** do preventative maintenance again in no more than 5 years and budget accordingly. Due to budget constraints, we cannot forget our road maintenance. When road maintenance is postponed, the cost will always be a higher.
6. We recommend that we, the POA BOD, and Staff realize that there are many products available to extend the life of our roads and save money before having to Mill & Pave. We need to evaluate and accept that there are other alternatives to preserve asphalt besides our current Rejuvenate or Mill/Pave methods. We need to use all of the products in the tool box between the least costly and the most expensive. We cannot afford to mill roads and repave before it is absolutely necessary.
7. We recommend continuing education on asphalt paving, preservation products, and maintenance procedures. There are conferences, workshops, seminars, and online classes that can be used to expand our knowledge of asphalt preservation. Our Staff needs to take advantage of these offerings.
8. We recommend that **ALL** asphalt paving and preservation products be on the TDOT QPL list (Tennessee Department of Transportation Qualified Products List). This will save Tellico Village from having to test each product and will provide the added liability protection of the Village being able to say the State of Tennessee has qualified these products for use.

All products used must be applied by an installer with the proper distribution equipment and training that the material manufacturer requires and we should have references from past customers before approving an installer.

This is a current TDOT QPL (Qualified Products List) to help readers of this report know what is available:

- A. Standard Fog Sealers (AsPen, LD-7, Micro Pave)
- B. High Performance Fog Sealers (CHPF-1, Micro Pave-R, Fas Black, PMM, TRMSS)
- C. Rejuvenator Sealers (GSB-88, CMS-1PF, Rejuvenal)
- D. Pavement Rejuvenators (Replay, Biorester, Reclimate)
- E. Bituminous Pavement Treatments (Guard Top, Liquid Road, Road Guard, ONYX-R1)

9. We recommend "Thin Lift Overlays" be evaluated for use per TDOT's recommendation at our meeting 1-27-17. Randy Busler and Ben Price at TDOT say they have 10 years of test sections where $\frac{1}{2}$ " , $\frac{3}{4}$ " and $1 \frac{1}{4}$ " overlays have performed nicely at a great cost savings to a full 2" overlay. Why mill down 2" and pave 2" if there is another way that will save us money and spend our road dollars more efficiently?

10. During our 4-month review of asphalt road maintenance, preservation products, and Pavement Management Systems, it is evident that we need to hire an independent third party to assist the Public Works Department in preparing proper specs for projects, have the project inspected as it is being done, have the products tested to ensure the product meets the specs, and have a testing lab do Quality Assurance Inspections during asphalt placement. NOTE: All paragraphs below show that this must be mandatory.

Readers might say that these recommendations are too expensive but consider the paragraphs below and realize that we are already paying. We just don't know when or where these expenses will show themselves.

Our projected budgets have \$16 million dollars in road paving and rejuvenation through 2034. In addition, Tellico Village has asphalt parking lots, golf paths, and trails that require the same asphalt maintenance as our roads IF they are to reach their normal service life. These must also be included in our annual pavement budget projections on one PMS (Pavement Management System). This truly confirms that our roads are our most expensive assets to the POA of Tellico Village.

We are currently proposing to rebuild Chota Road for \$51,000 which has lasted (2) TWO years since being repaved and should have lasted 15 years or more. Since this road repaving was being paid for by the Baptist Church's General Contractor who damaged the roads, we had the perfect opportunity to write a spec, require an asphalt mix design, and verify (with a testing lab) that Chota Road was being built to last and we should have held the contractor responsible for that work.

In 2017, we are milling and paving the Yacht Club Parking Lot (\$80,000) and the Tanasi Parking Lot (\$115,000) both of which are only 7 years old and should have lasted 15 years. We were told by Donald Reid and Tim Martin, (Engineer and paving expert and inspector for the city of Nashville, see Contacts at the end of this report) that the mixes for these lots did not have enough asphalt in them. We got bad mixes delivered and placed which you cannot determine without testing. We did not write the proper specs, require an asphalt mix design, and verify, by testing, before paying for the work.

We were also planning to mill 2" and pave 2" on Sequoyah Road for \$119,000 which we now know is unnecessary, and we have been told by 4 industry experts that the road does not need to be milled and paved. Public Works records indicate that Sequoyah Road was last overlaid in 2010, the same year Tanasi Shores, Chota Shores, and the Yacht Club parking lot were done. So it only lasted 7 years instead of 15 years.

In summary, we are spending \$365,000 this year and we don't know how long the repaving will last. We cannot accurately budget for our road maintenance if we don't have an idea how long the repaving will last or what to do to make it last.

Without improving our specifications, contracts, testing and inspection requirements, we will never be able to forecast our asphalt overlays and preservation work accurately

This report was prepared by the PSAC Paving Subcommittee: Ken Holland and Charles Queener researched, interviewed industry engineers and experts, and had numerous road assessment reviews by industry experts of our Tellico Village Roads. This was done between January and May 2017. Jeff Gagley, from the Tellico Village Public Works Department, was involved and updated weekly throughout this study.

Below is a listing of our industry experts along with other sources of information a reader might want to know exists.

Contacts and Sources for Information:

1. Donald Reid, (14 years) Assistant Director of Public Works and Paving Manager, Metro Nashville. BS Civil Engineering, 16 years with TDOT prior to Nashville. Is very willing to help us evaluate pavement preservation products. He has tried and tested most of them in Nashville. Donald.reid@nashville.gov , 615-880-3358. He instituted TDOT's Pavement Management System. A wealth of information and experience. He came to Tellico Village and inspected our roads with Tim Martin, Lead Paving Inspector for Collier Engineering for 15 years and the primary inspector for Nashville's Paving Crew, with 12 years' prior experience working as a paving supervisor for LOJAC Asphalt.

2. PRI Pavement Restorations, Inc, Jon Hargett-President, (731) 707-0731, jon@gotpotholes.net has been doing pavement preservation for the City of Nashville for 8 years and he is an engineer with 10 years of asphalt experience before starting his business. His Knoxville manager is Greg Ailshie (14 years as an asphalt estimator and Project Manager with a large asphalt paving contractor), cell 865-765-7600, greg@gotpotholes.net . Their website is www.gotpotholes.net and it describes the work they do. They will assess our roads and score them, recommend a pavement preservation method, bid the project, etc. They are a tremendous asset and have applied all of the road treatments that Nashville uses.

They are willing to present to our POA BOD all of the products that are used. Jon speaks at pavement seminars around the country.

3. Knoxville Public Service Director, Chad Weth, (865) 215-2060, cweth@knoxville.gov recommended we talk with Eric Peterson with Foundation Systems Engineering for pavement testing and evaluation like the do for the City of Knoxville. (see next contact)
4. Foundation Systems Engineering, P.C. (a joint company with Construction Materials Laboratory) which can provide-specification writing assistance, pavement testing, pavement design, pavement repair recommendations for Tellico Village and they do this for the City of Knoxville currently. Our contact person is Eric Peterson, PE, Senior Geotechnical Engineer, (865) 577-3361, epeterson@fsepc.com, We met with Jack Llewellyn, Jr. PE and President of Foundation Systems Engineering and Scott Fitzgerald, President of Construction Materials Laboratory to determine their capabilities in helping Tellico Village.
5. NuOrigin, Bimal Shah-President, 841 Cranberry Lane, Nolensville, TN 37135, (615) 423-8115, Email: ShahB@NuOrigin.com. This company was recommended to us by Donald Reid, (See reference #1 above) as a company to help us set up a GIS Pavement Management System. He would be worth interviewing along with other vendors.
6. Tennessee Transportation Assistance Program at UTK. TTAP is available to provide NO-Cost technical assistance to all local governments in TN and they will help us also. (865) 974-5255 or email TTAP@utk.edu . Matt Cate, (865) 805-2115 cell. You might also talk with Spence Meyers. TTAP also has free seminars and classes that we should attend.
7. Ranking of Roadways for the City of Kingsport, TN., Barge Waggoner Sumner & Cannon did this for the above city in 2016. See bargewaggoner.com and talked with John Hunter at (865) 934-4171. They will bid assessment of our Village roads.
8. NCAT at Auburn University: <http://eng.auburn.edu/research/centers/ncat/> National Center for Asphalt Technology. Has courses that can be taken online. Have a test track where people from all over the US go to see pavement preservation improvements. Asphalt Pavement Preservation & Rehabilitation

Course-online, 5 hours, \$320, you get 5 hours CEU credits. Pavement Management Systems Course (PMS) course is online for one hour and is \$80 or you can get a training cd for \$100 which can be viewed by all personnel. The resources are out there and available to us.

9. NCPP at Michigan State: <http://www.pavementpreservation.org> a huge video library of training videos to watch and learn about pavement preservation. National Center for Pavement Preservation = NCPP. Plenty of info we can learn from.

10. October 2016 National Pavement Preservation Conference, Nashville, TN. <http://nationalpavement2016.org> Live demonstrations were held outside Titan Stadium of fog seals, scrub seals, thin overlays, micro surfacing. 800 attendees from every state and foreign countries. We should be attending these and learning about road maintenance.

11. Tennessee Road Builders Association, Kent Starwalt, Executive VP, Nashville, TN (615) 255-5751, kent@trba.org

12. LDA Engineering, Steve Drummer PE, Sr. Civil Engineer, sdrummer@ldaengineering.com, 865-803-2673. An engineering company capable of writing specifications and mix designs for asphalt paving. They do not have a testing and quality control capability in house.

13. 4-27-17, Jeff, Charles, and Ken met with the representatives of a product that the Nashville PW Engineer, Donald Reid highly recommends. The product is called HA5 and the companies are willing to come do a test section for Tellico at no charge. The product has been around since 2002. The manufacturer for the Eastern US is Whitaker Contracting Corporation, Jim Reed, (256) 298-3911, out of Guntersville, AL and their Tennessee Distributer/Installer/Contractor is Jarrett Paving out of Nashville, TN, Benny Shepherd, VP of the asphalt division, 615-939-4246, Benny@jarrettbuildersinc.com