



Township of Branchburg

1077 US HIGHWAY 202 NORTH, BRANCHBURG, NJ 08876-3936

Telephone: (908) 526-1300 x100 Fax: (908) 526-2452

www.branchburg.nj.us

OFFICE OF THE ADMINISTRATOR

To: Township Committee
From: Gregory J. Bonin, Administrator
Date: June 14, 2017
Re: Road Program outline

Township Committee members,

Over the past 7 years the Township has embarked on a road management program designed to provide for the preservation of our roads and to identify those roads in need of measures that go beyond basic maintenance. This memo is intended to provide background information on how we approached the road program, the rationale for road selection, how we arrived at our treatment choice, what we have done to date and what we plan to do over the next few years.

The concept seems relatively simple: inspect and rank all the roads in the community and assign a timeline and method for preservation or repair. What made, and continues to make, this project somewhat complicated is the limited resources available and the ever changing condition of the roads.

Conventional road management programs take the position of treating the “worst first”, essentially ignoring those other roads which, if treated sooner, could have their useful life and “ride-ability” extended in favor of reconstructing those roads deemed the worst. The problem with this approach is that by the time the worst roads are treated the roads that were not in bad shape have now become the new “worst” and the only way to treat these roads is reconstruction which is an incredibly expensive process. This old approach does not fully take the economics of preventative maintenance into account.

The Township’s goal at the outset was a two-pronged approach; (1) identify the “worst” roads in town (those beyond preventative maintenance measures) and begin the task of scheduling and enacting the reconstruction of those roads. This work is the responsibility of the Engineering department. I will talk further on road reconstruction later in this memo; and (2) identify which roads would benefit from preventative maintenance through surface treatments. This work is the responsibility of the Department of Public Works. The analogy of seal coating your driveway is appropriate. We all do this (or should) every few years to preserve the pavement. The enemy of pavement is water seeping in through cracks creating the “freeze/thaw” affect and the oxidation of the road (in this process the pavement molecules become stiffer and more brittle over time). The purpose of preventative maintenance is to install a prophylactic cover to seal the road surface thereby preventing cracks, oxidation and delaying pavement degradation.

Branchburg Township has approximately 88 miles roads (not including County or State roads). Many years ago the Engineering department created a comprehensive road analysis and ranking system. This system became the basis for the beginning of the budget funded road program which started with the 2014 budget. It is important to note that the funds earmarked in the capital budget as “cash on hand” for road maintenance is for just that, maintenance, and does not include funding the township may provide through other capital funding for major reconstruction projects. For the first year of the program the DPW used the Engineering report and their own observations to identify the roads that would be selected and treated



for preservation. Each year after that DPW has evaluated each road and updated their ranking. The next step would be for the township to choose the method of sealing the road from the elements.

At this time the Township benefitted from the recent appointment of a new Director of DPW, Tom Mantz, who had decades of experience with the Township and took a more modern approach to road maintenance. Director Mantz researched various options that could be used as road sealants. Options identified were;

- Standard oil and stone chip seal: this is the process to which we are all familiar and one that has been used for many years in communities, including Branchburg. In this process a truck lays down a layer of oil and small stone is applied on top. The oil infiltrates the cracks and once dried the mixture of oil and stone seals the road and provides a rough surface for traction. This is the cheapest surface treatment and has an expected life span of 4-5 years at which time it would be expected that another treatment is applied. Traditionally this is a “messy” process which garners complaints from residents as oil and stone tends to kick up on to cars until the oil completely cures and the loose stones are completely removed or compacted. Until the mixture cures completely this process also can be slippery as the stones shift. It can take a week or more before all the loose stones are swept away. The cost for this process is approximately \$2.00 per square yard excluding traffic control or sweeping
- Cape seal: this process starts with the standard chip seal which is then covered with a slurry or micro-surface. This process provides for a smooth surface, seals the cracks and limits the loose stone problem of the chip seal. The National Park Service estimates this process will extend the road life by 6-8 years. The cost for this process is approximately \$3.50 per square yard not including traffic control or sweeping.
- Micro-surfacing; similar to the cape seal, this process provides a thinner pavement layer (about 1/4inch thick). The life expectancy of this product is also 4-5 years. This process is good for retarding the oxidation process but had virtually no crack resistance. The process take 6-8 hours to cure during which no traffic can travel on it. The cost for this treatment is approximately \$2.75 per square yard excluding traffic control.
- High Performance chip seal: this process brings the old oil and chip seal process into the 21st century. This process uses straight asphalt (not an emulsion) and crumb rubber. This mixture increases the ability to stretch and contract with the weather and therefore resists cracking. This product cools not cures, so the surface is traffic ready almost directly after application although it would be best for the traveling public to stay off for at least an hour. The loose stones are swept away almost immediately and the surface is fully drivable, with almost no loose stone, within an hour of application. This treatment also provides for a rougher surface providing better traction than other treatments. The life expectancy of this product is 6-8 years possibly 10 when applied in the early stages of oxidation. The cost for this treatment is approximately \$4.60 per square yard, including traffic control and sweeping.

No surface treatment is perfect and underlying cracks will eventually show through with any of the above treatments. This is not reconstruction. Multiple treatments are preferred to layer the product and create a thicker sealant on the roadway.

During the first year of the road maintenance program the DPW experimented with the various treatment options. As we had not used treatments, other than oil and stone, we were unsure how the other surface treatment applications would work. We applied the various treatments to roads in the township and observed their ride ability, traction and durability.



In the end, the township has settled on the high performance chip seal process as our surface treatment of choice. Compared to the other surface treatments this process has proven itself to be a durable product that is quick and clean to apply, provides a better level of crack resistance and a higher level of traction. When all of the above qualities and factors are taken into account we believe this treatment choice is the most cost effective for our community.

Since the inception of the road maintenance project in 2011 the township has surface treated approximately 44 miles of road way. While this is an impressive figure the reality is that with 88 miles of road, and a product lifespan of 6-8 years, our perfect program would provide for the treatment of approximately 15 miles of road each year. We are currently averaging 6.5 miles each year. While making great headway in road preservation we will continue to be behind where we should be in a perfect program. In a program that has almost unlimited resources, we should be approaching a schedule that provides for a new surface treatment on roads done in the first phase of our program. The reality is that our municipal budget, with fiscal constraints imposed by the State and those imposed by our own fiduciary conservatism, we cannot realistically provide the funding for a perfect program.

Attached to this memo is a chart showing the roads treated thus far and a projection of roads scheduled for preventative surface treatment in 2017 and beyond. It is important to keep in mind that the projected maintenance schedule may change depending on the changing conditions of our roads. As stated earlier, roads are evaluated each year and the program is adjusted accordingly.

In addition to our road maintenance program, each year the township has a road reconstruction program. Unlike maintenance, this program identifies those roads that are in need of major repairs beyond a surface treatment. In most cases these means both total road reconstruction (taking the road down to dirt and rebuilding) or a mill and pave operation where we scrape away (mill) the top inches of pavement and replace with fresh asphalt.

The benefits of road reconstruction are obvious: a new, smooth road that has an expected 20 year lifespan. While the benefits are clear road reconstruction is very expensive. For example the current estimated costs to mill and pave a road is approximately \$18.00 per square yard. It should be added that our experience has shown that the asphalt being produced over the past 15-20 years is not nearly as good a product as has been produced in the past. Our newer roads are decaying faster than before and even roads paved within the past 5-7 years are showing degradation requiring preventative surface treatment.

When talking about road reconstruction many variables go into our discussion and decision making process:

- The higher costs of such a project
- Limited resources of our budget
- Sewers – where are the areas in town not serviced by sewers and the road conditions in that area. Before we repair a road in these areas we survey residents to determine if they would like sewers extended to their homes. This is an added project cost with some of the additional costs being paid for by the residents who elect to obtain sewers.
- State aid – the State provides grants to help fund reconstruction of what they term major collector roads (roads that serve to move many people through and around the Township – e.g. River Road, Baird Rd, Stony Brook Rd, Old York Road to name a few). When possible we obtain grants to help offset the cost of reconstructing these roads. The successful receiving of these grants help



the township afford major road improvements and often determine what project we will do during any given year.

- Drainage or other utility improvements – when reconstructing a road it makes sense to consider performing all possible or needed improvements. Such improvements could include drainage work, installation of water, sewer or gas lines and sidewalks. These improvements not only add drastically to the cost of the project but also the time it takes to design.
- It has become township policy to reconstruct roads in the manner to which they exist at the time of the project. That is to say if there are no improvements such as sidewalks, drainage or curbing in place, none will be planned to be installed. The exceptions to this policy would be if such improvements are necessary (e.g. drainage issues on Preston Dr. or Kenbury Rd.), asked for by the residents or deemed necessary by the Township (e.g sidewalks to facilitate safe pedestrian traffic). Prior to commencing any road project we have surveyed residents and have given them the ability to petition for any improvements they would like to see on their road.
- A limiting factor for road reconstruction projects is our in house staff's ability to design and oversee construction projects. While we could outsource for this work it certainly would add much to the overall road expenses thereby utilizing more taxpayer dollars to achieve the same goals we would achieve over a slightly longer timeframe. We believe our road project timeline does not warrant these additional costs to the taxpayers.

Once identified as a candidate for reconstruction, each road is discussed to determine the best approach for that road. Considerations in this discussion would include any of the items listed above and may also include the specifics of the road and vicinity. For example, we all know North Branch River Road is a cut through from Old York Road to Rt. 202 northbound. We also know people tend to speed on that road. The road is in need of some form of treatment, at a minimum, to seal the surface. But that would not improve its ride ability as sections are quite uneven. Were we to reconstruct the surface of the road it would make for a smoother ride which may in fact increase speeding and resident complaints. While the police would make a point to enforce the speed limit, the fact is they cannot be everywhere at all times. Speeding will happen. If we were to simply seal the road surface it would preserve the pavement which currently is not showing signs of extreme damage.

No road program is perfect and in some sense the plan that has evolved is as much “art” as it is “science”. That is to say from both the cost and evaluation perspectives we have applied the most current technologies and methodical approach with the many decades of staff experience and knowledge of the community.

It is our hope that as the program progresses that road maintenance funding will remain stable and the residents will continue to see regular improvements around the township.