

Noble County Highway Department

Transportation Asset Management Plan



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Introduction

In an effort to operate Noble County Highway Department in the most efficient, transparent and fiscally responsibility manner, the Noble County Transportation Asset Management Plan was created. The highway department is charged with the maintenance and management of the county highway system infrastructure. This includes daily operations, such as snow removal, roadway maintenance, brush removal, etc. and long-term planning and capital improvements, such as bridge repairs, roadway improvements and culvert replacements. With such a broad scope of operations, limited financial resources must be prioritized carefully. Therefore, the following are the three main goals of the Noble County Transportation Asset Management Plan:

- To minimize the life cycle cost of both equipment and infrastructure assets through annual evaluation and programming of repairs, rehabilitation and replacement.
- To maximize funding opportunities, while minimizing operating and project costs.
- To maximize human resource potential through training and HR best practices.

Though these three goals are interconnected, there are specific plans that address the best practices of each.

Asset Management

Asset management in its simplest form consists of the evaluation of a system and prioritization of current and future resources. The major assets under the charge of the highway department are as follows:

- Highways within the jurisdiction of Noble County.
- Bridges within the jurisdiction of Noble County.
- Culverts within the jurisdiction of Noble County.
- Noble County Highway Equipment Fleet.

An individual plan has been developed to strategically manage each of these systems.

Transportation Asset Management Plan - Highways

The Noble County Highway Department maintains over 820 miles of roadway. The County Engineer annually conducts road condition ratings for the entire system. The ratings utilize the PASAR rating system which is endorsed by LTAP. All data is collected within the Noble County GIS system and then published annually as the *Road Evaluation Report*. This data is in tabular form as the *Pavement Asset Inventory*. The Noble County Highway system received an average rating of 6.06 in 2016, which is an increase from 5.87 in 2015 and 5.67 in 2014.

The *2016 Road Evaluation Report* is attached..

Following rating, a prioritization matrix utilizes road rating data combined with traffic counts, population density, preparation work and a repair timeline to compile an annual road improvement plan based on available funding. This data is published annually as *Roadway Rehabilitation and Maintenance Plan*. A majority, if not all, road rehabilitation and maintenance work is completed in-house using highway work force.

The overall effectiveness of the plan is determined by an Estimated Service Life Evaluation. This evaluation projects an estimated increase in service life for each repair method and then compares this increase to the aging of the entire network. The 2015 road improvement plan added 805 years of additional service life, while the paved highway network (742 miles) aged one year, resulting in a gain of 63 years of service life. Using this method long term funding and rehabilitation methods are strategically planned. The 2016 plan projects an increase of 876 ESL.

Current projections call for an average annual investment of \$1.5M in material costs. This correlates to approximately 700-800 years of additional service life. Following this plan the average road rating will increase from fair (5.67) in 2014 to good (7.02) in 2020. Historically, 800 years of additional service life would have been an unrealistic goal; however, with recent changes to the Highway Department's finance/funding and a focus on preservation and in-house cost effective reconstruction, this goal is now achievable. The highway department also plan to take advantage of the new Local Road and Bridge Matching fund, utilizing special distribution funds as the local match.

The 2016 *Roadway Rehabilitation and Maintenance Plan* is attached. A detailed scoping report for subdivisions improvements is also completed, the 2016 *Subdivision Scoping Report* is Appendix C within the this plan.

Transportation Asset Management Plan - Bridges

The Noble County Engineering Department is charged with maintaining 64 bridges in Noble County. Biannual inspections are conducted through the Local Public Agency (LPA) Grant program with the County Engineer acting as the employee in responsible charge (ERC) and project manager. All bridge evaluation, condition and rating information is published every two years in the *Noble County Bridge Inventory Report*.

The 2015 *Noble County Bridge Inventory Report* is attached.

Bridges with a sufficiency rating above 80 are typically in good condition and only require normal maintenance or minor repairs on specific elements. Bridges with a sufficiency rating between 50-80 are typically in fair condition but require rehabilitation within a short term to avoid future expensive maintenance cost. Bridges with a sufficiency rating below 50 are in poor condition and require replacement or closure in the near future.

Bridge repairs, rehabs and replacements are then prioritized and sorted by funding sources. Bridge repairs and preservations are done in-house when applicable. Smaller bridges are scoped for design alternatives such as precast structures, large culverts or modular bridge construction.

Larger bridges are scoped for various funding grants, most notable LPA grants. Once selected for the LPA grant application process, preliminary design and construction cost estimates are generated. The engineer serves as the project manager throughout design, right of way acquisition, utility relocation and construction.

The inventory data is combined with prioritization factors to create the *Bridge Rehabilitation and Replacement Plan*. There are currently sixteen bridges in need of replacement. The *2016 Bridge Rehabilitation and Replacement Plan* is attached.

Equipment Management and Replacement Plan

This Equipment Management and Replacement Plan was developed as a tool to manage the Noble County Truck and Heavy Equipment fleet in the most efficient manner. The plan covers an equipment needs assessment, current equipment evaluation, replacement analysis and long term transition plan.

The needs assessment quantifies fleet requirements for all highway operations done throughout the year. This is then compared to the current fleet for deficiencies and surplus. Surplus inventory is put up for auction and deficiencies are evaluated for cost effectiveness of purchase versus rental. Any required purchases are then added to the long term equipment purchase plan.

A fleet analysis sorts fleet age and uniformity. An ideal fleet consist of a uniform engine design, a single type of diagnostic equipment and minimum set of stocked parts. Currently, we have seven manufactures between sixteen trucks. An ideal fleet maintains an average age equal to the half-life of a standard vehicle with a bell curve distribution. The correlates to an ideal highway fleet having an average age of 5.5 years and no more than one new truck or one old (10+ year) truck. Currently, our average truck age is 11.1 years with two new trucks being purchased in 2014 and seven old (10+ year) trucks. Update: two tandem dump trucks were purchased in 2016.

The next part of the plan is the replacement analysis. Each piece of equipment's value is assessed using straight-line depreciation model. The depreciated value is then compared to the most recent 3 year maintenance cost. The three year annual maintenance value is used as an approximated planning marker. Once a vehicle's maintenance ratio (3 Year Maintenance Cost / Depreciated Value) is greater than or equal to 1.0, it should be transitioned to part-time status or replaced within the next 5 years. These values are then used to determine the priority for vehicle transitions with the highest ratio taking top priority.

Lastly, all the information is compiled into a long term transition plan. The plan minimizes annual maintenance cost by effectively managing fleet age distribution and transitioning

equipment when it reaches the end of its cost effective life. Data is updated annually to ensure long term success. The 2015 long-term plan called for the purchase of one Mini Excavator, one wheel loader and six dump trucks in the next 5 years. As of April of 2016, one Mini Excavator, one wheel loader and two dump trucks have been purchased.

Following this plan, the highway fleet will reach an ideal age distribution in 2021. This correlates to a breakeven point (comparing maintenance cost savings vs. equipment purchases) in 2019.

The *2015 Equipment Maintenance and Management Plan* is attached.

Culvert Inspection and Inventory Report

The Culvert Inspection and Inventory Report is currently under development. Once completed (projected for 2017) it will consist of standardized inspection of all county highway maintained large (48" or greater) culverts. The information will be compiled using an ArcGIS application. Repairs, rehabilitation and replacements are then prioritized and assigned design and construction schedules. In 2016, the Highway Department hired a full time inspector and purchased the necessary survey equipment to complete this work.

Long Term Funding and Finance Objectives

Due to limited financial resources and an aggressive infrastructure improvement plan, fiscally responsible long term programming is required. To meet this goal, it is essential to minimize operating and project cost, while simultaneously maximizing all available funding opportunities.

Minimizing Operating and Project Cost

In 2015 the annual budget was reorganized to correctly fund both current operations and long term needs. This included committing all cumulative capital development funds specifically to bridge projects and setting aside funding in the local roads and streets fund for future equipment purchases. The current annual budget is then used as a metric for long term planning of all bridge, culvert and roadway projects and equipment purchases through our asset management plans.

Maximizing Funding Opportunities

As a government entity, the Noble County Highway department is fiscally restrained to a specific set of funding sources as allotted by Indiana Code and local ordinances. As such, the highway department seeks to maximize all sources.

CEDIT - The highway department seeks funding support from the biannual budget for equipment purchases as outlined in the Equipment Management and Maintenance Plan.

Rainy Day - The rainy day fund is used in the absence of other sources for large capital improvement projects or for funding match for unexpected grant awards.

Surtax / Wheel Tax - In 2016, Noble County began collecting the Surtax / Wheel Tax at the maximum limit.

Cumulative Capital Development Fund - In 2014, Noble County Council modified the highway distribution of this fund from 60% to 75%. The CCD fund serves as the sole source for all bridge improvement projects.

Grants - The highway department prepares multiple LPA grant applications for each funding call. Proper supporting data (HSA, Preliminary Engineering, Right of Way calculations, detailed cost estimates etc...) is compiled ahead of time to give each application the best chance for award. Other grants opportunities, such as the *Local Road and Bridge Matching Fund*, are researched and applied for when applicable.

In summary, the above listed practices will provide the financial foundation for the detailed asset management plans, which in turn provides for long term infrastructure improvements.

Human Resources Policies and Procedures

Due to the complexity and variety of work, the biggest and best resource the Noble County Highway department has at its disposal is the highway employees. To maximize the human resource potential several new policies and procedures are under development.

Employee Involvement - Each employee is brought in on projects specific to their area of work or expertise. I.E. Township drivers are being incorporated into road condition ratings and highway improvement projects within their individual townships. Mechanics and operators are included in the review future equipment purchases.

Safety - Safety has been prioritized and incorporated into every facet of the highway culture. The Highway Safety committee was created in 2014. The committee oversees the reporting and correction of safety items. The Highway Safety Manual is currently being drafted.

Training - All training opportunities are reviewed and any training that enhances an employee's skill or adds value to the highways program are scheduled on an individual or group basis.

Management - A tiered management breakdown has been incorporated shifting responsibility from a single individual (Road Superintendent) to multiple leaders (foreman on specific projects and operators on smaller operations.)

Summary

Combining effective management of human resources, financial resources and infrastructure and equipment assets significantly changes the long term quality and success of the Noble County

Highway program. This transportation asset management plan provides both a snapshot of current conditions along with a trajectory and plan for long term capital improvements. The following are the current projected improvements:

Roadway - Average road rating have increased from fair (5.67) in 2014 to good in (6.06) in 2016 and is projected to increase to good (7.02) in 2020.

Bridges - All sixteen bridges earmarked for immediate rehabilitation or replacement will be under development (design, right of way, utilities and construction) or replaced by 2022, with the final bridge being constructed in 2025.

Culvert - The Culvert Inspection and Inventory will be launched in 2016 for 2017 publication.

Equipment - The entire highway fleet will transition from its current average age of 11.1 years to an ideal age distribution in 2021. This correlates to an annual maintenance cost savings of 50%.

Funding / Finances - Current funding sources are organized and aligned to support all facets of this plan.

Human Resources - Long term changes are currently being implemented to improve the quality of life for each employee as well as the overall effectiveness of the highway program.