

ROADWAY PAVEMENT REHABILITATION EVALUATION



PREPARED BY:

 **PANHANDLE**
ENGINEERING, INC

Civil Engineers - Environmental Engineers - Land Planners
3005 Lynn Haven Parkway • Lynn Haven, FL 32444
Office: (850)763-5200 Email: pe@panhandleengineering.com

December 2015

Panhandle Engineering No. 14405

TABLE OF CONTENTS

EXECUTIVE SUMMARY

- OBJECTIVES OF EVALUATION
- TYPES OF ROADWAYS BY USE
- TYPES OF ROADWAYS BY CONSTRUCTION
- GEOTECHNICAL CORES OF PAVEMENT
- STRUCTURAL DISTRESS RANKING
- ROADSIDE DRAINAGE
- PEDESTRIAN SAFETY
- PAVEMENT REHABILITIZATION COSTS
- RECOMMENDED PRIORITIZATION
- FUNDING SOURCES

MAPS AND EXHIBITS – TAB 1

- COLLECTOR ROADS
- NON-LH ROADWAYS WITHIN CITY LIMITS
- KEY MAPS BY AREA – 5 SHEETS

PHOTOGRAPHS – TAB 2

- DISTRESS CRACKING
- REPAIR PATCHES
- ROADWAY DRAINAGE & PONDING
- PAVEMENT SETTLEMENT AT MANHOLES
- EDGE OF PAVEMENT FAILURES
- ENCROACHING TREE ROOTS

GEOTECHNICAL CORES OF PAVEMENT – TAB 3

- CORES AND LOGS #1
- CORES AND LOGS #2

EVALUATION SUMMARIES– TAB 4

- AREA A
- AREA B
- AREA C
- AREA D
- AREA E
- AREA F
- AREA G
- AREA I

EXECUTIVE SUMMARY

Panhandle Engineering, Inc. has prepared this Roadway Pavement Rehabilitation Evaluation Report pursuant to the City Commission’s authorization.

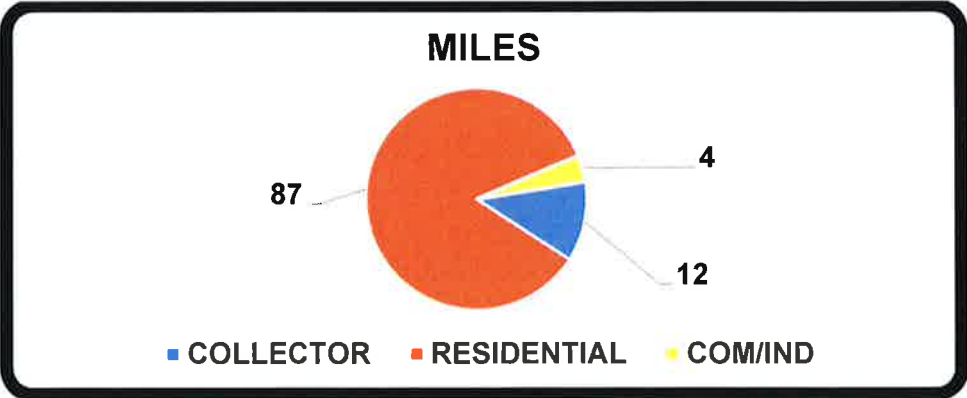
The purpose and objective of this Report is to provide:

- A qualitative assessment of the City’s public paved streets
- A quantitative estimate of various rehabilitation methods and
- A recommended prioritization for rehabilitative actions for next 10 years

ROADWAYS BY USE

Panhandle Engineering assigned the City’s roadways into three (3) primary use categories; Collector, Residential and Commercial/Industrial. Collector roadways serve as a corridor that serves more than one significant neighborhood and connects to a major thoroughfare or State & County arterial roadways. Residential roadways serve as the initial roadways directly serving the residential neighborhoods in the City. Commercial and Industrial Roadways serve primarily those uses and may have specific performance requirements exceeding those of Collector & Residential Roadways. An exhibit is included within Tab 1 of this Report.

- **Collector Roadways** 12 miles
- **Residential Roadways** 87 miles
- **Commercial/Industrial Roadways** 4 miles
- **Total Paved Roadways** 103 miles



It is noted the there are other paved roadways within City Limits that are not the maintenance responsibility of the City. These include FDOT/County and privately owned roadways. An exhibit is included within Tab “1” of this Report identifying the FDOT, County and private roads.

ROADWAY CONSTRUCTION

Lynn Haven's paved roadways are predominately asphaltic concrete in general accordance with Florida Department of Transportation (FDOT) specifications. The more aged roadways were not constructed to meet current FDOT specifications.

We recommend that future rehabilitation of these roadways include consideration of cores, milling to remove distressed surface material and improve crowning of roadway, a leveling course to smooth un-even surfaces and a structural overlay, utilizing current FDOT "SuperPave" asphalt mix designs, to restore the structural load-bearing wearing surface.

A few roadways in the vicinity of Florida Avenue, north of East 10th Street are constructed of Portland Cement Concrete. These segments exhibit wide joint separations and some fatigue cracking. Repairing these conditions is far less costly than removal and reconstruction of the road. Repairing may consist of mud-jacking, replacement of cracked areas and joint sealant.

All paved roadways have an underlying base material that is critical to the performance and service life of the surface pavement. We recommend that areas of subsidence or pothole patches be repaired in the initial phase of a roadway's rehabilitation.

The City has approximately seven (7) miles of very aged Sand Asphalt Hot Mix (SAHM) residential roadways. SAHM is not considered to have a structural value and historically was placed as a stabilization material over dirt roads. Preparing these roadways and applying a structural overlay is a high priority.

There are a few dirt roads and alleys within City Limits, which are not within the scope of this report. The City has placed milled asphalt in some of these locations to stabilize them, but they should be improved at some time in the future.

These roads are as follows:

- Bradenton Avenue – Alamo to City Limits
- Missouri Avenue – W 19th Street –North End
- E 9th Street – Davis Lake to Iowa Avenue
- Railroad Alley
- Alley B
- Alley C

GEOTECHNICAL CORES OF PAVEMENT

Geotechnical cores of random, but representative, pavement sections were obtained from selected roadways to provide a better understanding of the pavement thickness, underlying materials and moisture conditions. The results are included within Tab 3 of this Report.

The cores identified pavement thicknesses ranging from 1.25" to 5.25". Underlying base materials, which support the asphalt pavement, varied from no base material to a sand/clay mix to limerock. Some unsuitable materials, such as peaty fine sands, were also noted.

Groundwater observed during the coring activities was 2' to 4' below the pavement. Surficial groundwater and roadside drainage are one of the primary conditions that adversely impact the service life of the paved roadways and accelerate distress causing subgrade failures, pot holes and surface cracking. A day following a rainfall event we noted many roads were seeping water up through the pavement cracks. This softening of the base material and the repetitive introduction of drainage into the cracks must be addressed in a timely manner so that this condition does not create more costly rehabilitation requirements.

We recommend having geotechnical cores performed for all future pavement rehabilitations. This information will allow for the best selection of repair and rehabilitation methods. Not just the primary methods of milling, leveling and overlayment, but also re-stabilizing the subgrade, specifying a rubberized membrane, crack relief, etc.

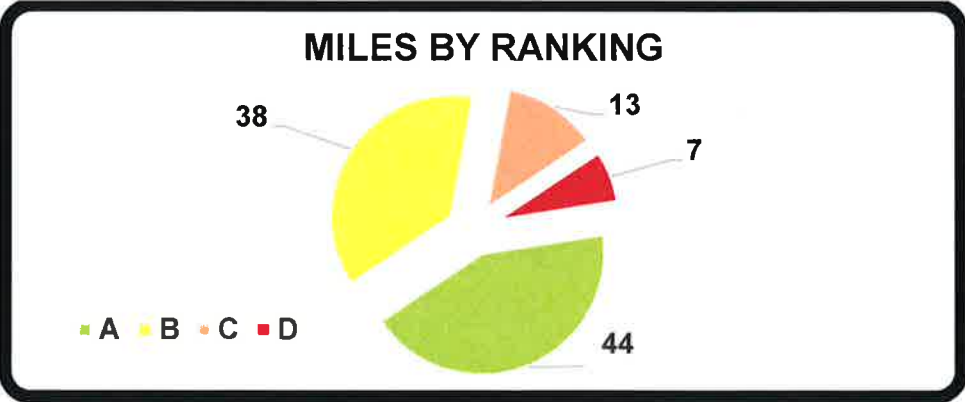
STRUCTURAL DISTRESS RANKING

Panhandle Engineering visually inspected all the roadways, applying standard engineering evaluation criteria, and ranked the paved roadways into four (4) Rankings for maintenance rehabilitation.

The importance of identifying the level of structural distress is to schedule and undertake rehabilitative maintenance activities in a timely manner that will protect the paved roadways from further deterioration that is more costly to remedy.

The four (4) ranking categories are:

- A. Good Overall to Limited Distress 44 miles**
- B. Moderate Distress 38 miles**
- C. Significant Distress 13 miles**
- D. Sand Asphalt (Non-Structural) 7 miles**



The qualitative evaluation of the paved roadways included level of distress cracking (longitudinal, transverse and bi-directional), travel lane, quartering, structural patches, utility repair patches, tree roots, edge of pavement deterioration, drainage ponding in roadway, raised manhole rims and groundwater seepage.

With over **100 miles** of paved roadways within the City, there is a range of distress within each ranking. Integrating field observations requires an understanding of how distress has occurred and why. Utility patches, for example, may be solely associated with a water service leak or for new home construction or it may provide an indication that a gravity sewer main under the pavement is cracked and creating roadbed chronic failures.

Photographs of representative examples of distress and included within Tab 2 and Exhibits are included within Tab 4 of this Report that provide a street by street qualitative assessment.

ROADSIDE DRAINAGE

Our review of the roadways included roadway drainage. This does not include primary drainage infrastructure, but drainage from the roadways or adjacent properties that have an impact to the structural integrity of the pavement and its service life. Most roadways in the City are not curbed and piped, so stormwater runoff is managed along the outboard edge of pavement, typically in shallow grassed swales or ditches. In some areas, the roadside swales no longer exist, leading to ponding within the roadway, which contributes to premature distress.

Most residential roadways constructed prior to 2000, have been impacted by the encroachment of grass and tree roots along the edge of pavement.

Future pavement rehabilitation projects should include removal of roots within the pavement, cutting back encroaching grass and reshaping the sodded swale prior to structural overlayment.

PEDESTRIAN SAFETY

Panhandle Engineering also looked at pedestrian safety, specifically along collector roadways where there are no sidewalks or existing sidewalks "dead end". It is our recommendation that the construction of pedestrian sidewalks be considered for implementation concurrent with or as a stand-alone safety improvement.

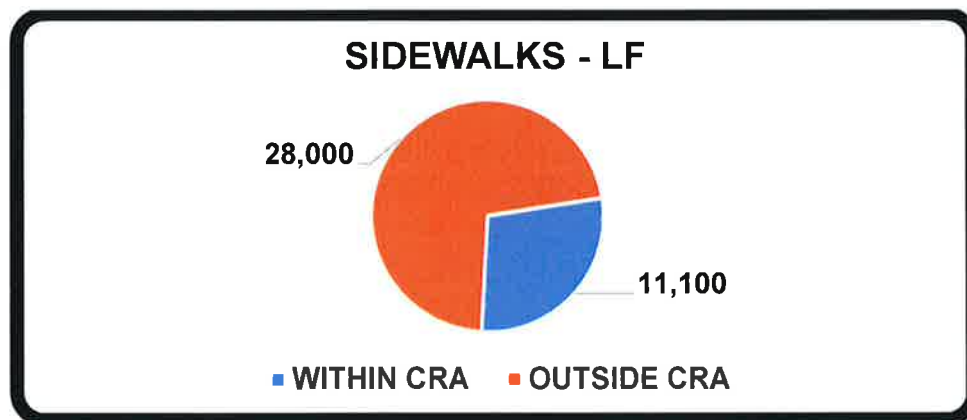
Other than along Collector roadways, the City has required residential subdivisions since circa 2000 to include sidewalks. The City also, primarily through the Community Redevelopment Agency (CRA) has constructed several sidewalk segments within the limits of the CRA district.

We have identified approximately 7 ½ miles of proposed sidewalks along Collector roadways.

- West 26th Street – SR 77 to Jenks Avenue
- Tennessee Avenue – West 5th Street to SR 390
- East 26th Street – CR 389 to Minnesota Avenue
- Minnesota Avenue – East 17th Street to Railroad
- Minnesota Avenue – Mosley Drive to Baldwin Road
- Maine Avenue – West 14th Street to SR 390
- West 14th Street – Maryland Avenue to Tennessee Avenue
- West 5th Street – Tennessee Avenue to Kinsaul Park
- East 8th Street – Iowa Avenue to Colorado Avenue
- Illinois Avenue – East 3rd Street to CR 390
- East 39th Street - CR 389 to Camryn Crossing

The Preliminary Opinion of Probable Construction Costs (POPCC) for these sidewalks totals \$ 1,643,500.

A portion of the recommended sidewalks lie within the CRA district.



REHABILITIZATION COSTS

Panhandle Engineering prepared a Preliminary Opinion of Probable Construction Costs (POPCC) for several methods of rehabilitation.

The recommended primary rehabilitation methods include:

- Milling to remove distressed surface material and improve crowning of roadway.
- Leveling course to smooth un-even surfaces with or without milling.
- Structural Overlay, utilizing current FDOT "SuperPave" asphalt mix designs, to restore the structural load-bearing wearing surface.
- Based on geotechnical cores, additional methods may be specified in the Construction Documents.

Based on the structural distress rankings and the unit costs for the various rehabilitation methods, we have summarized the estimated rehabilitation costs. We have estimated that 90% of the C & D ranked roadways will require milling and/or leveling and 50% the A & B ranked roadways will require milling and/or leveling. An allowance is included for roadside drainage improvements, striping and signage.

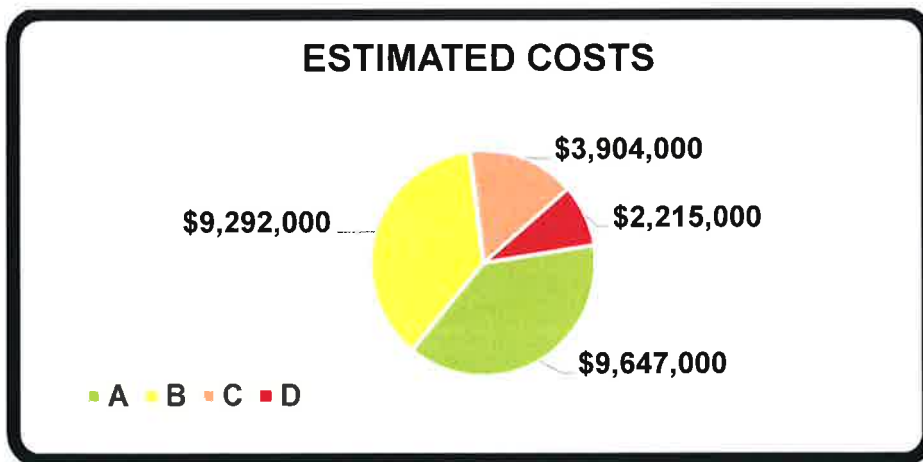
RECOMMENDED PRIORITIZATION

Panhandle Engineering prepared, based on the findings noted within this Report, recommended a prioritized rehabilitative maintenance schedule. We have formatted the priorities into short term, mid-term and long term anticipated rehabilitation needs in order to correct existing structurally deficient roadways and to initiate a scheduled rehabilitation program that will protect the City's roadway infrastructure assets from more expensive roadway and roadbed reconstruction.

- Short term, 0 - 3 years, are the highest priority for funding and implementation of pavement rehabilitation of Rankings "D" & "C".
 - **\$ 6,120,000**

- Mid – Term, 5 – 10 years is the secondary priority for funding and implementation of pavement rehabilitation of Rankings "B".
 - **\$ 9,292,000**

- Long term, 10 - 20 years, is the lowest priority for funding and implementation of pavement rehabilitation of Rankings "A".
 - **\$ 9,647,000**



It should be noted that within each priority, there are roadways that have higher and lower needs. Based on scheduled or committed funding, **Panhandle Engineering** will provide a specific listing of roadway segments from within the short-term priority. A more refined

cost opinion for the selected roadways will be based on preliminary rehabilitation plans and specifications.

Selection and scheduling for rehabilitation should also consider scheduled or anticipated major utility and major drainage infrastructure improvement projects. The pavement rehabilitation and infrastructure improvements should be constructed concurrently in a planned sequence.

FUNDING OPPORTUNITIES


Panhandle Engineering has the knowledge of all types of loan and grant programs with the State of Florida and Federal Government. The following programs can be used to fund road paving improvements:

- Ad Valorem Taxes
- CRA (Sidewalks)
- Gas Tax
- Sales Tax (Voter Referendum)
- Conventional Finance
- Bond
- Public Private Partnership (P3)
- Private Finance
- Community Budget Issue Request (CBIR) – State Legislative
- Bay County Commission
- Wastewater Enterprise Fund for Gravity Sewer Replacement Only
- Community Development Block Grant (CDBG)
- FDOT - Community Traffic Safety Team (CTST)
- FDOT - Safe Routes to Schools
- FDOT – Safety Improvement Grants

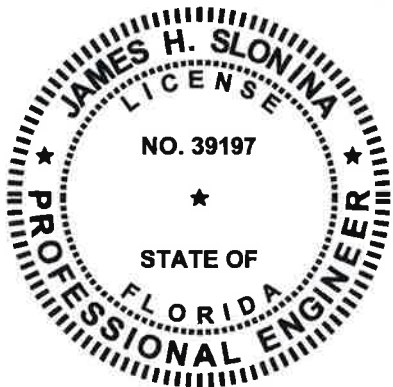
Once you have had an opportunity to review this report, we recommend meeting to discuss the findings and recommendations in more detail and provide clarification as may be required.

Regards,

Panhandle Engineering, Inc.


James H. Slonina, PE
9 Dec 2015

President





Christopher B. Forehand, PE

12/9/15

Vice President

