Roadway Asphalt Pavement Evaluation

ENGINEERS ◓ SURVEYORS ◓ ENVIRONMENTAL

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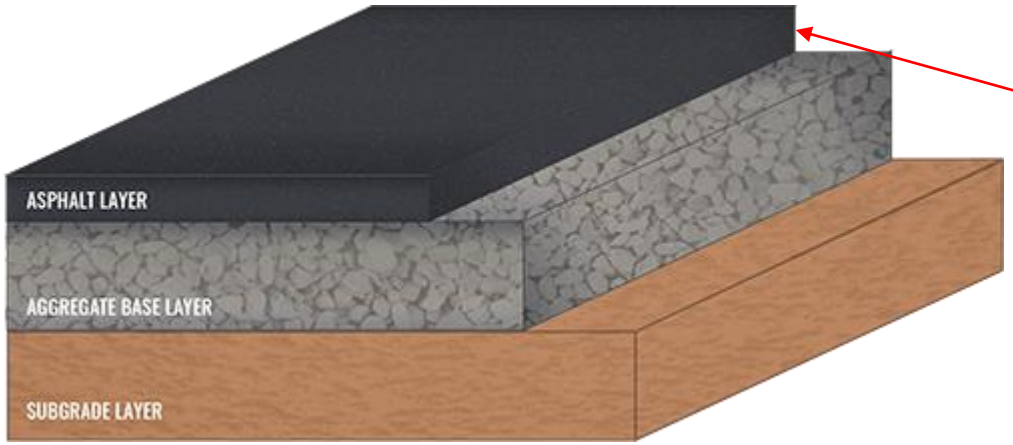
What is asphalt?

- Asphalt is a dark, highly viscous, hydrocarbon produced from petroleum distillation residue. Asphalt is used to create a paving solution made from a mixture of aggregates, binder, and filler. Aggregates are processed mineral materials such as crushed rock, sand, gravel, slags, or various recycled materials. Binder is used to unite the aggregates together to form a cohesive mixture. Bitumen is most often used as the binder.
- Asphalt can be applied in various lifts, mixes, and consistency.
- Asphalt is most frequently used in the top 1-3 courses of a roadway pavement section. These are called the surface or wearing courses. The underlying layers typically consist of a compacted or stabilized rock called the “Base”. Underneath the base is the “subgrade”, a compacted layer of earth forming the road bed.



Pupose

- Catalog up-to-date evaluation of surficial asphalt pavement conditions of the Towns roads.
- Determine the types of prevalent pavement distresses and severity on the Towns roads.
- Determine priority of roadway improvements based on factors such as roadway type, presence and extent of pavement distress, level of service, and magnitude of resurfacing and/or reconstruction required.
- Communicate the findings of this evaluation to Town Council for decision making on the Towns need for addressing asphalt distresses and future roadway improvement projects.
- Provide an estimated expected life of the existing road asphalt based on observed distresses and condition of road only. No life cycle or life expectancy modeling.
- Provide potential resurfacing, restoration, and or reconstruction methods for distressed roadways.

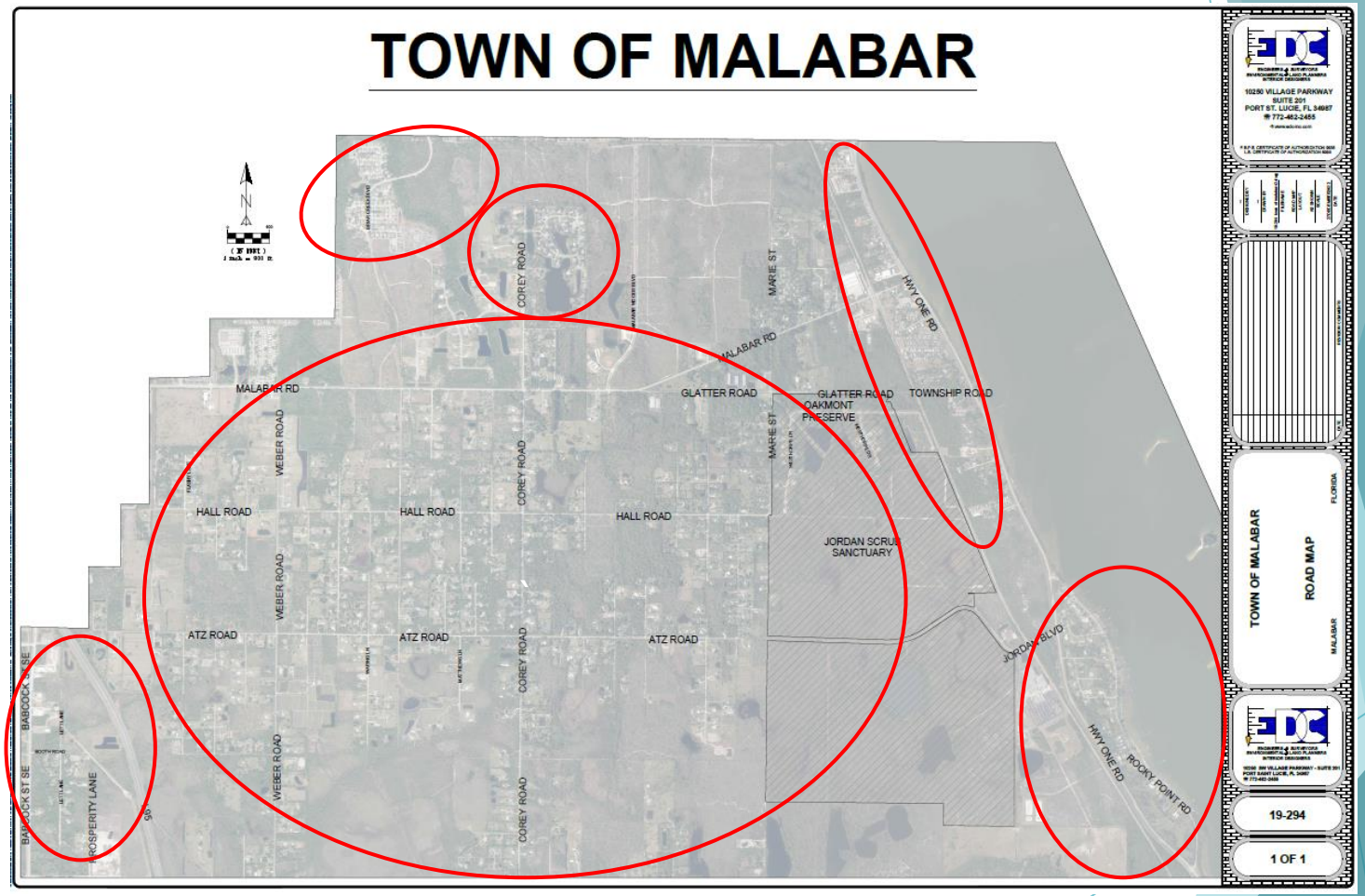
Briar Creek Boulevard

Excluded from Asphalt Evaluation

- Resurfacing, Restoration, and/or Reconstruction Plans for the town roadways.
- Specific cost estimating for any resurfacing, restoration, and/or reconstruction of specific town roadways.
- No subsurface base, subgrade, etc observations, explorations, or evaluations of the town roadways.
- Traffic counts or traffic impact analysis of the town roadways.
- Quantitative life cycle and/or life span modeling for the existing roads. This requires additional investigations and data not included in the contract.

Rocky Point Road

Roads Surveyed



INCLUDED: ALL ASPHALT PAVED ROADS OWNED AND MAINTAINED BY TOWN OF MALABAR

EXCLUDED: UNPAVED ROADS, ASPHALT MILLINGS ROADS

FULL LIST OF INCLUDED ROADS ARE INCLUDED IN THE FINAL REPORT

Pavement Distresses

ALLIGATOR CRACKING

CORAL WAY

Pavement Distresses

BLOCK CRACKING

FALLS TRAIL

Pavement Distresses

DISTORTIONS

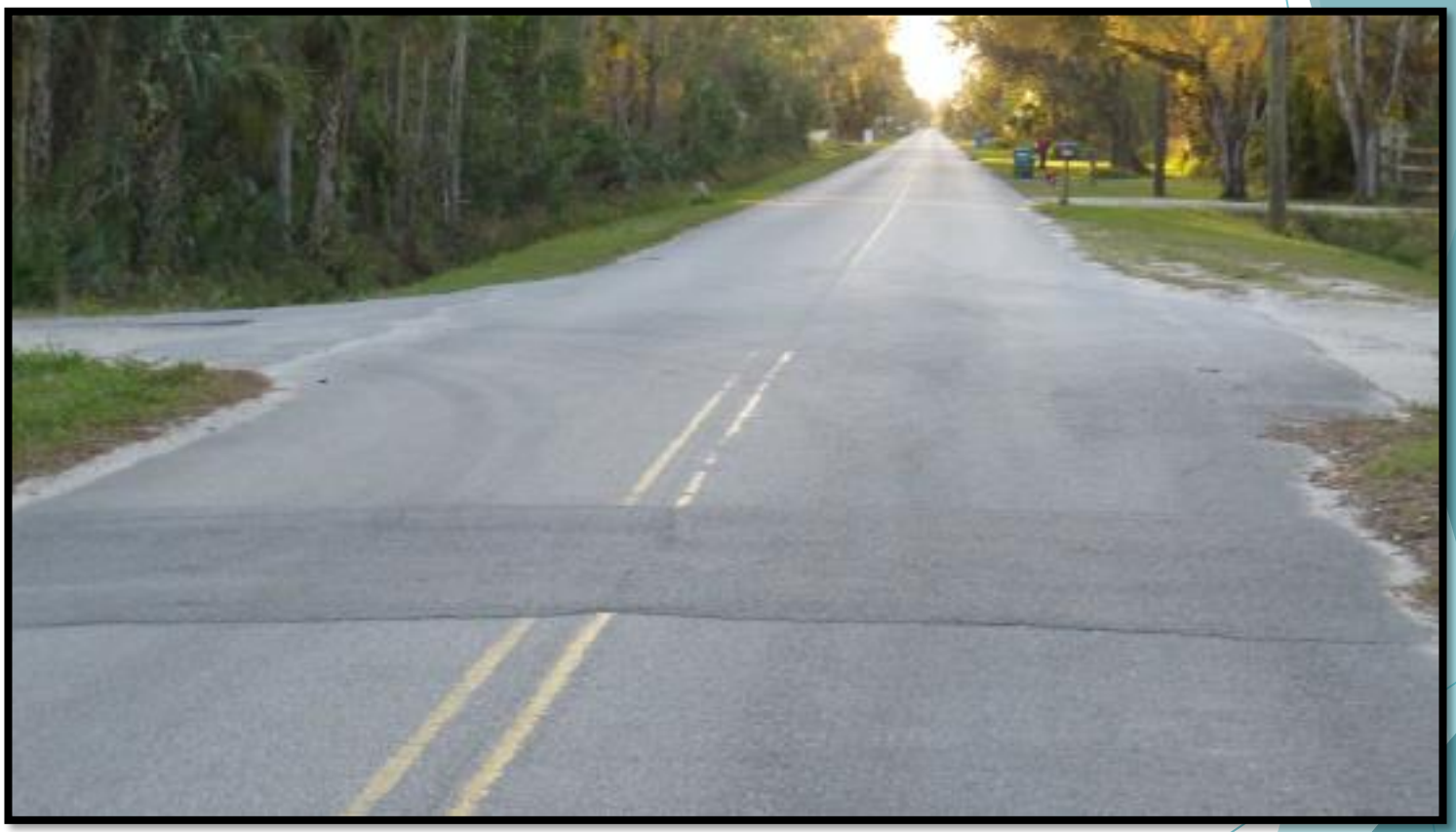
MALABAR ROAD

Pavement Distresses

LONGITUNDINAL AND
TRANSVERSE CRACKS

COREY ROAD

Pavement Distresses



PATCHING, UTILITY CUTS, REPAIRS

FALLS TRAIL

Pavement Distresses

RUTTING AND DEPRESSIONS

WEBER ROAD

Pavement Distresses

WEATHERING AND RAVELING

OLD MISSION ROAD

Distress Scoring

- For purposes of this report EDC has provided a modified pavement index methodology to score the distress density and severity of the roadways. The higher the density and/or severity of distress the higher the score.
- Distress density is categorized as LOW (0-25%), MEDIUM (25-50%), or HIGH (greater than 50%). These levels score on a scale of 1-3 respectively for each type of distress.
- Distress severity is categorized as LOW, MEDIUM, or HIGH. These levels score on a scale of 1-3 respectively for each type of distress.
- The density and severity scores for each type of distress observed are multiplied. The observed distress type scores are then added to represent a total roadway distress score. An example is provided below:

PAVEMENT DISTRESS EVALUATION					
DISTRESS TYPE[1]:	DENSITY	SCORE	SEVERITY	SCORE	PRODUCT
ALLIGATOR CRACKING	LOW	1	MEDIUM	2	2
BLOCK CRACKING	LOW	1	LOW	1	1
DISTORTIONS	MEDIUM	2	LOW	1	2
LONGITUDINAL,TRANSVERSE CRACKS	MEDIUM	2	LOW	1	2
PATCHING, UTILITY CUT, REPAIRS	HIGH	3	LOW	1	3
RUTTING AND DEPRESSIONS	LOW	1	LOW	1	1
WEATHERING AND RAVELING	LOW	1	MEDIUM	2	2
				TOTAL DISTRESS SCORE:	13.00

Adjusted Distress Scoring

- While distress scoring provides a means of ranking the town roads based on their asphalt condition it does not provide a means for discerning other considerations for level of service to the town transportation network. As such, this report provides an “adjusted” score that takes into account the observed level of traffic during the field evaluations (no traffic counts) and the type of roadway (local, collector, or arterial). The Town’s roads consist mostly of lower traffic, local roads. However, there are multiple collector roads with medium to high levels of observed traffic. Although the Town’s roads connect to multiple arterial roads there are no arterial roads on the list of roads being evaluated.

- Road type is assigned a multiplier for local (0.50), collector (1), or arterial (1.5).

- Observed traffic is assigned a multiplier for low (0.50), medium (1), or high (1.5).

ROADWAY TYPE AND TRAFFIC ADJUSTMENT							
					TOTAL DISTRESS SCORE:	**7.00**	
					ROADWAY TYPE MULTIPLIER	0.5	
					TRAFFIC MULTIPLIER	0.5	
7	x	0.5	x	0.5	=	1.75	
DISTRESS SCORE		ROAD MULTIPLIER		TRAFFIC MULTIPLIER		**ADJUSTED SCORE**	

Pavement Evaluation Scoring

ROADWAY INFO	
ROADWAY NAME:	Brian Creek Blvd and Briar Run Circle
ROADWAY TYPE:	COLLECTOR
OBSERVED TRAFFIC:	MEDIUM
SURVEYED LENGTH (FT):	2,875
CONDITION DESCRIPTION:	AGED IN NEED OF RESTORATION
AVG PAVEMENT WIDTH (FT):	23
START INTERSECTION:	Port Malabar Rd
END INTERSECTION:	Malabar Scrub entrance

PAVEMENT DISTRESS EVALUATION					
DISTRESS TYPE[1]:	DENSITY	SCORE	SEVERITY	SCORE	PRODUCT
ALLIGATOR CRACKING	HIGH	3	LOW	1	3
BLOCK CRACKING	HIGH	3	LOW	1	3
DISTORTIONS	MEDIUM	2	MEDIUM	2	4
LONGITUDINAL,TRANSVERSE CRACKS	HIGH	3	LOW	1	3
PATCHING, UTILITY CUT, REPAIRS	MEDIUM	2	MEDIUM	2	4
RUTTING AND DEPRESSIONS	LOW	1	LOW	1	1
WEATHERING AND RAVELING	MEDIUM	2	MEDIUM	2	4
				TOTAL DISTRESS SCORE:	22.00

ROADWAY TYPE AND TRAFFIC ADJUSTMENT							
					TOTAL DISTRESS SCORE:		22.00
					ROADWAY TYPE MULTIPLIER		1
					TRAFFIC MULTIPLIER		1
22	x	1	x	1		=	22.00
DISTRESS SCORE		ROAD MULTIPLIER		TRAFFIC MULTIPLIER			ADJUSTED SCORE

NOTES:
Significant distresses at entrance from Port Malabar Rd Worst concentration of distresses is NE of bridge Serves a mix of single family, multi-family, and recreation (scrub/santuary access) The portion of road off Port Malabar Rd is owned and maintained by City of Palm Bay. This is the most severly distressed portion. Restoration efforts would need to be coordinated with City of Palm Bay. RECCOMENDED REPAIR(S): The portion of road from the Briar Creek Bridge to Port Malabar Road has significant patching, alligator cracking, longitundinal/transverse cracking, weathering, and raveling. Surface treatments for rejevenation and sealing are not reccomended as this appears to be a more systemically distressed portion of road. Reconstruction of this portion of road may be necessary. Subsurface and structural investigations are reccomended to further confirm this. The portion of road west/south of the Briar Creek Bridge exhibits lower severity block cracking and longitudinal/transverse cracking. Milling and resufacing is more appropriate than sealing and rejvenation due to the age and traffic on the road. EXPECTED LIFE OF CURRENT ASPHALT: 0-5 YEARS

Distress Score Results

RESULTS SUMMARY SORTED BY DISTRESS SCORE ONLY				
ROAD NAME	TYPE	LENGTH (ft)	WIDTH (ft)	DISTRESS SCORE
Coral Way	Local	1550	22	23.00
Briar Creek Blvd & Brian Run Circle	Collector	2875	23	22.00
Booth Road	Local	630	18	21.00
Huggins Drive	Local	808	22	21.00
Coquina Terrace	Local	1350	20	15.00
Rocky Point Road	Collector	7590	22	15.00
Hollow Brook Lane	Local	2045	20	14.00
Township Road	Local	1056	20	14.00
Reef Place	Local	510	20	13.00
Weber Road	Collector	10560	23	13.00
Brookshire Circle	Local	334	20	11.00
Hall Road	Collector	13200	20	10.00
Marie Street	Collector	5280	22	10.00
Corey Road	Collector	14460	22	9.00
Oak Tree Place	Local	389	20	9.00
Old Mission Road	Local	1950	18	9.00
Country Cove Circle	Local	3085	20	8.00
Oak Harbour Lane	Local	338	20	8.00
Pemberton Trail & Bluff View Place	Local	1168	20	8.00
Benjamin Road	Local	3375	18	7.00
Blanche Street	Local	1060	20	7.00
Falls Trail	Local	1219	20	7.00
First Lane	Local	240	20	7.00
Florence Street	Local	1060	20	7.00
Homestead Lane	Local	1200	20	7.00
Steeplechase Circle	Local	358	20	7.00
Atz Road	Collector	13221	23	6.00
Century Oak Circle	Local	1260	20	6.00
Gilmore Street	Local	1280	20	6.00
Glatter Road	Local	2890	18	6.00
Holloway Trail	Local	324	20	6.00
Jordan Blvd	Collector	1010	70	6.00
Riverview Drive	Local	780	20	6.00
W Railroad Avenue	Local	1830	20	6.00
Lineberry Lane	Local	1200	20	5.00
Baywood Court	Local	200	21	2.00
La Court Lane	Local	2640	18	2.00
Eva Lane	Local	2640	20	1.00
Hunter Lane	Local	1320	20	1.00
Smith Lane	Local	1320	20	1.00

Adjusted Distress Score Results

RESULTS SUMMARY SORTED BY ROAD TYPE AND TRAFFIC ADJUSTED SCORE				
ROAD NAME	TYPE	LENGTH (ft)	WIDTH (ft)	ADJUSTED SCORE
Briar Creek Blvd & Brian Run Circle	Collector	2875	23	22.00
Weber Road	Collector	10560	23	19.50
Rocky Point Road	Collector	7590	22	15.00
Corey Road	Collector	14460	22	13.50
Hall Road	Collector	13200	20	10.00
Marie Street	Collector	5280	22	10.00
Atz Road	Collector	13221	23	6.00
Jordan Blvd	Collector	1010	70	6.00
Coral Way	Local	1550	22	5.75
Booth Road	Local	630	18	5.25
Huggins Drive	Local	808	22	5.25
Coquina Terrace	Local	1350	20	3.75
Hollow Brook Lane	Local	2045	20	3.50
Township Road	Local	1056	20	3.50
Reef Place	Local	510	20	3.25
Riverview Drive	Local	780	20	3.00
Brookshire Circle	Local	334	20	2.75
Oak Tree Place	Local	389	20	2.25
Old Mission Road	Local	1950	18	2.25
Country Cove Circle	Local	3085	20	2.00
Oak Harbour Lane	Local	338	20	2.00
Pemberton Trail & Bluff View Place	Local	1168	20	2.00
Benjamin Road	Local	3375	18	1.75
Blanche Street	Local	1060	20	1.75
Falls Trail	Local	1219	20	1.75
First Lane	Local	240	20	1.75
Florence Street	Local	1060	20	1.75
Homestead Lane	Local	1200	20	1.75
Steeplechase Circle	Local	358	20	1.75
Century Oak Circle	Local	1260	20	1.50
Gilmore Street	Local	1280	20	1.50
Glatter Road	Local	2890	18	1.50
Holloway Trail	Local	324	20	1.50
W Railroad Avenue	Local	1830	20	1.50
Lineberry Lane	Local	1200	20	1.25
Baywood Court	Local	200	21	0.50
La Court Lane	Local	2640	18	0.50
Eva Lane	Local	2640	20	0.25
Hunter Lane	Local	1320	20	0.25
Smith Lane	Local	1320	20	0.25

Pavement Maintenance, Restoration, Reclamation, and Reconstruction

SURFACE TREATMENT, SEALING, COATING, REJUVENATION

FOG SEALING

SLURRY SEALING

CHIP SEALING

ASPHALT REJUVENATORS

CRACK SEALING

SCRUB SEALING

Pavement Maintenance, Restoration, Reclamation, and Reconstruction

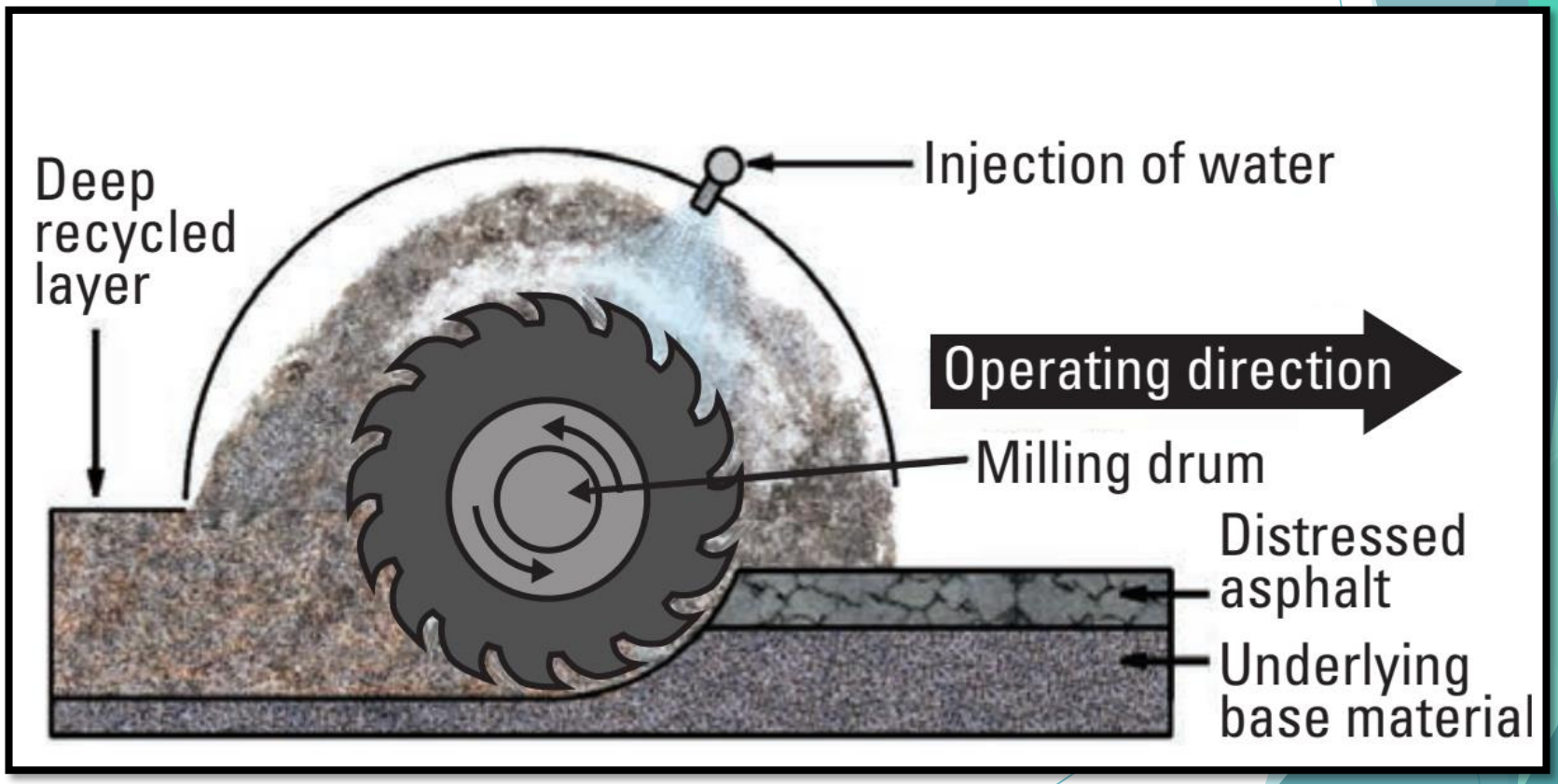
MICROSURFACING

Pavement Maintenance, Restoration, Reclamation, and Reconstruction

MILLING AND RESURFACING (OVERLAY)

Pavement Maintenance, Restoration, Reclamation, and Reconstruction

FULL DEPTH RECLAMATION



Pavement Maintenance, Restoration, Reclamation, and Reconstruction

RECONSTRUCTION

Comparisons

The following are lift expectancy of various types of pavement preservation, restoration, and rehabilitation.

Treatment	Recommended Year of Initial Treatment	Life Expectancy of Treatment (Years)
Preservation		
Crack Sealing	1 to 3	2 to 6
Fog Seals	0 to 3	1 to 2
Slurry Seals	2 to 6	3 to 5
Scrub Seals	2 to 6	1 to 3
Rejuvinators	1 to 7	3 to 4
Microsurfacing	3 to 7	4 to 7
Chip Seals	2 to 5	4 to 7
Thin HMA Overlay (0.5"-1.5")	5 to 8	7 to 10
Rehabilitation		
Structural Overlay (>2")	12 to 15	8 to 10
Reconstruction		
Full Depth Reclamation	>20	25
Reconstruction	>20	25

The following are the primary benefits of various types of pavement preservation, restoration, and rehabilitation.

Treatment	Roughness	Friction	Noise	Life Extension	Moisture Reduction
Crack Sealing				X	√
Fog Seals				X	√
Slurry Seals	√	√	√	√	√
Scrub Seals				√	√
Rejuvinators				√	√
Microsurfacing	√	√	√	√	√
Chip Seals	√	√	√	√	√
Thin HMA Overlay (0.5"-1.5")	√	√	√	√	√
Structural Overlay (>2")	√	√	√	√	√
Full Depth Reclamation	√	√	√	√	√
Reconstruction	√	√	√	√	√

√ = Major Effect
X = Minor Effect

Good-Fair-Poor Windshield Surveys

Condition	Definition
Very Good	Stable, no cracking, no patching, and no deformation. Excellent riding qualities. Nothing would improve the roadway at this time.
Good	Stable, minor cracking, generally hairline and hard to detect. Minor patching and possibly some minor deformation evident. May have dry or light colored appearance. Very good riding qualities. Rutting may be present but is less than ½".
Fair	Generally stable, minor areas of structural weakness evident. Cracking is easier to detect, patched but not excessively. Deformation more pronounced and easily noticed. Ride qualities are good to acceptable. Rutting may be present but is less than ¾".
Poor	Areas of instability, marked evidence of structural deficiency, large crack patterns (alligatoring), heavy and numerous patches, deformation very noticeable. Riding qualities range from acceptable to poor. When rutting is present, rut depth is greater than ¾".
Very Poor	Pavement in extremely deteriorated condition. Numerous areas of instability. Majority of section showing structural deficiency. Ride quality is unacceptable (probably should slow down).

Summary and Recommendations

- All Town of Malabar asphalt roads were inspected, scored and adjusted for distress, and cataloged (photos, reports) for their current condition.
- In general, the Town of Malabar's asphalt roads are safe and are exhibit normal distresses or their respective aged and traffic. Other than the Rocky Point Rd hurricane erosion no major or imminently dangerous failures were during this evaluation.
- A handful of newer roads wont need restoration for 15-20 years, while most all others will need some form of surface treatment in the next 5-15 years.
- Some older, more frequently traveled roads have exhibit distress sufficient to warrant further investigation to structural and subsurface layers. These higher distressed roads may warrant surface treatments or perhaps reconstruction/reclamation in the next 0-5 years.
- It is recommended that any road proposed for improvement should first be investigated by a geotechnical engineer using "cores" to determine subsurface conditions of existing roads.
- In areas of poor drainage that may be contributing to asphalt failure it is recommended that drainage improvements also be factored into decision making for associated road improvement projects.
- It is recommended that the Town of Malabar evaluate pavement failures that are due to unpaved driveways and determine reasonable options for getting them paved.
- For future roadway reconstruction or resurfacing projects it is recommended that the Town take advantage of any undergroung utility or drainage improvements that can be made at the same time.
- Town of Malabar Public Works should perform annual windshield surveys of the paved road system using the Good-Fair-Poor

Thank You

Rocky Point Road