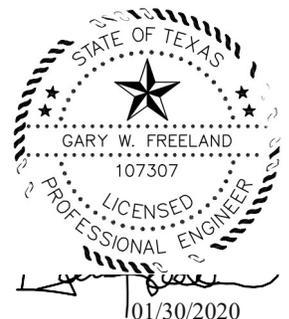


# CITY OF SMITHVILLE

## STREET MAINTENANCE PLAN

January 30, 2020



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### EXECUTIVE SUMMARY

Freeland Turk Engineering Group, LLC (FTEG) prepared this Street Maintenance Plan and sign inventory (under separate cover), as per our agreement. A summary of our approach, assumptions, observations, conclusions and recommendations related to the development of this plan is provided in this report .

FTEG utilized the Roadbotics technology to collect street data on December 5 and 8, 2019 for the approximate 40 centerline miles of City maintained public roadways.

Roadbotics provides a rating level at approximate 10' intervals along every roadway and assigns a level for each point. Each point is combined along a roadway segment, typically block to block, or intersection to intersection (such as alleys) and the collective segment is assigned an average rating. There are 806 street segments in the Smithville assessment. A description of the ratings along with the percentage of Smithville street segments falling into those categories are described below:

Level 1 "Green" = 1.00 to 1.49 - 3.60% (29 of the 806 segments) were rated Level 1.  
No or very minor surface damage. This road may be a newly paved roadway.

Level 2 "Light Green" = 1.5 to 2.49 - 39.95% (322 of the 806 segments) were rated Level 2.  
Minor surface damage, no critical issues. This road is starting to show typical wear and tear.

Level 3 "Yellow" = 2.5 to 3.49 - 40.32% (325 of the 806 segments) were rated Level 3.  
Appearance of pervasive surface distresses. Important surface issues are starting to show.

Level 4 "Orange" = 3.5 to 4.49 - 12.41% (100 of the 806 segments) were rated Level 4.  
Significant damage or emerging critical failures. Road damage is beginning to intensify.

Level 5 "Red" = 4.5 to 5.00 - 1.49% (12 of the 806 segments) were rated Level 5.  
Major surface damage and/or critical surface failures are present on the road surface.

Not Rated "Gray" = No Score - 2.23% (18 of the 806 segments) were not rated.  
Unpaved or dirt roadways will fall into this category. Occasionally, a severely deteriorated paved roadway, or a chip sealed roadway with light colored or brown colored gravel will fall into this category.

For this Maintenance Plan, Level 4 and 5 rated streets were prioritized and provided recommendations for maintenance activities.

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## DESKTOP ASSESSMENT AND ANALYSIS

Using the Roadbotics data, FTEG performed a desktop assessment and analysis of Smithville's existing street pavements. The Roadbotics data, along with Google Earth, USGS Topography and other miscellaneous information were used to provide this analysis.

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## FIELD VISITS

Windshield observations were made to verify specific areas where desktop information sources were inadequate for a conclusive assessment and analysis for the roadway system. Field visits were also made to specific areas where longstanding drainage issues were known to exist or suspected based on the desktop analysis.

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## MAINTENANCE ACTIVITY RECOMMENDATIONS

FTEG identified recommended maintenance activities for each segment of paved public street in Smithville, except for TxDOT or County facilities, alleys, private streets, gravel/dirt streets and street rights-of-way with no improvements. The specific maintenance activities and improvements identified in this plan are intended to keep, or restore, a street's pavement to a good (or better) quality rating. The Maintenance Plan can be found in Appendix A.

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## PRESERVATION ACTIVITIES

Many of Smithville's streets are situated in areas of relatively flat topography with limited storm drain conveyance systems (inlets, storm drains, roadside ditches, etc.). As such, slow moving stormwater runoff and water ponding can cause many streets to experience accelerated deterioration.

The scale of this issue presents a significant street maintenance challenge for Smithville. Of all maintenance type activities, preservation is the cheapest and most cost-effective approach to keeping pavement in good condition.

*Sweeping and Silt/Debris Removal* - The accumulation of silt and debris hinders the flow of stormwater runoff on pavement. The streets in Smithville should be swept at least quarterly, or more often as needed. Streets in flat areas should be given priority when resources are an issue.

*Vegetation Removal* - The existence of vegetation is an indication of pavement cracking and deterioration of base material. Vegetation should be removed chemically if it is unable to be regulated by sweeping, and until the area can be repaired by patching.

*Crack Sealing*- Cracks more than 1/16-inch-wide should be sealed with appropriate crack sealing material when observed or, at a minimum, on an annual basis. Visible cracks and curb seams should be sealed on a 2 or 3-year cycle.

*Patching*-Areas of distressed pavement, like potholes and alligator cracking, should be patched by saw cutting at least one foot outside the distressed area(s), removing the material (at least six inches depth), properly recompacting the subgrade material and installing at least 6 inches of hot mix asphaltic concrete (HMAC). The full depth HMAC patching approach enables the pavement to better resist surface moisture. Also, the HMAC is relatively easy and quick to install, saving street maintenance crew time and reducing inconvenience to the traveling public.

*Concrete Aprons* - Concrete aprons and valley gutters should be installed in areas where water ponding cannot be mitigated and/or significant storm water runoff flows down or across a street . Concrete surfaces improve stormwater runoff and resist surface moisture better than asphalt.

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## REHABILITATION ACTIVITIES

Rehabilitation maintenance activities are generally done to replace the existing pavement surfaces and include mill and overlay and chip seals. Both approaches are commonly used in Texas and are considered cost-effective.

*Chip Seal* - Seal coats are typically recommended for use in low volume traffic areas where the existing pavement surface has experienced significant wear, including raveling or loss of aggregate. Prior to application of the single course chip seal, the existing surface is prepared by crack sealing, patching and applying level-up asphalt.

*Mill and Overlay* - HMAC overlays are typically recommended for use in higher volume traffic areas, arterials, truck routes and where better ride quality is desired. They are used to replace existing asphalt pavement surfaces that exhibit significant wear, patching and/or cracking. Prior to the application of typically 1 ½" to 2" of HMAC overlay, the existing asphalt surface is removed by milling, the base material in distressed areas is replaced and, if needed, level-up is applied to fill in depressions.

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## RECONSTRUCTION

Reconstruction is typically recommended when a street has experienced significant deterioration of the pavement surface, base material and subgrade. In these areas, salvaging the pavement is not cost-effective and new materials must be used. The recommended approach involves replacing the base material and pavement surface "in-place" or at the same line and grade of the existing street. The existing surface and base materials are excavated and removed. The subgrade is proof rolled and properly compacted or stabilized prior to placement with new flexible base

material. HMAC is installed in higher volume traffic areas, arterials, truck routes and where better ride quality is desired. A two course chip seal is applied in lower traffic volume areas. Curbing may also be installed or replaced as needed to help preserve the integrity of the new materials.

An alternative to replacing "in-place" reconstruction is street reclamation. This approach involves grinding the existing base and surface material, adding an asphaltic oil emulsion, recompacting the mixed material, and installing a HMAC or two course chip seal to complete the surface. This approach requires the presence of existing quality base material.

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## FULL RECONSTRUCTION

Full reconstruction involves new construction of all street components and usually involves geometric changes, regrading, storm drain systems, utilities, et c. This approach would typically be recommended for mitigating the root cause to a chronic problem (e.g. drainage). We recommend the City conduct further engineering evaluations to identify potential candidate projects for streets that are causing recurring street maintenance problems in Smithville. We recommend preservation activities continue for these streets while studies are underway. However, it is suggested that street rehabilitation or reconstruction be deferred until engineering studies can be completed to identify these potential candidate projects.

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## PRIORITIZATION OF PROJECTS

The streets for the maintenance plan were prioritized based on streets ranked four or five in the Roadbotics Assessment.

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## STREET MAINTENANCE PLAN

The plan consists of a list of Level 4 and 5 streets. The plan can be found in Appendix B. The contents are summarized below:

*Street*- Name of public paved street owned and maintained by the City of Smithville.

*Street Limits* - Beginning and end of the street segment.

*Street Length* - Length of street segment between center of intersections or end point(s) as computed by RoadBotics data.

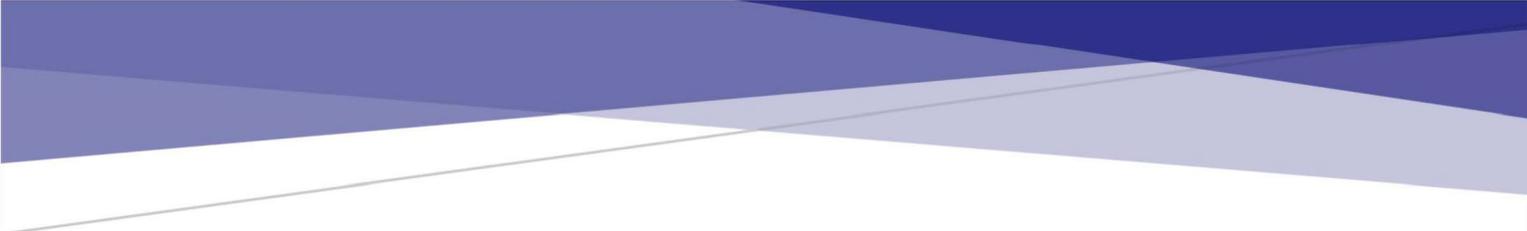
*Maintenance Activity Type* - Recommended preservation, rehabilitation or reconstruction activities needed to restore the given street segment to good (or better) pavement condition.

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## CONCLUSION

FTEG utilized the Roadbotics collection system, the accompanying data, and on-site observations in order to assess the street conditions of the City and prepare a maintenance plan for the City. This maintenance plan will bring the City's streets, that are ranked four or five in the Roadbotics database, into better condition and help prevent further deterioration of those City's streets. This plan should not over-prioritize the streets within this plan and maintenance activities should be implemented to maintain the integrity of those streets not included in this plan.

# APPENDIX A



MAINTENANCE PLAN

City of Smithville											
Street Maintenance Plan											
Street Segment	From	To	2019 Roadbotics Quality	Potential Drainage Issues	Length (FT)	Existing Surface	Proposed Treatment	Base Repair	Patching Percentage	Other Preparation	Notes
2nd Avenue	Live Oak St	Corner	3.50		378	B	CS	Patching	10.0%	Level Up	Primarily a dirt road that could be chip sealed to prevent more routine maintenance (blading/filling)
3rd Avenue	Pine St	Hickory St	4.00		372	CS	CS	Patching	5.0%	Level Up	
3rd Avenue	Hickory St	Elm St	4.03		352	CS	CS	Patching	5.0%	Level Up	
3rd Avenue	Elm St	Live Oak St	4.78		360	CS	CS	Patching	5.0%	Level Up	
3rd Avenue	Live Oak St	End	4.00		184	B	CS	Patching	15.0%	Level Up	
5th Avenue	Pine St	midblock	3.50		158	HMAC	CS	Patching	10.0%	Level Up	
5th Avenue	Hickory St	Live Oak St	4.15		656	CS	CS	Patching	5.0%	Level Up	Low Water Crossing, may be candidate for concrete reconstruction of low water crossing
5th Avenue	Live Oak St	End	4.13	Y	346	B	CS	Patching	5.0%	Level Up	Partial dirt road at end, may be excluded as it appears to serve private property
6th Avenue	Maple St	Ash St	4.13		203	HMAC	P			Crack Seal	Low volume roadway
Ash Street	5th Ave	4th Ave	3.85		324	B	CS	RIP			
Ash Street	6th Ave	5th Ave	4.00		329	B	CS	RIP			
Ash Street	Near 7th Ave	6th Ave	4.00		147	B	CS	RIP			
Bishop Street	NE 4th St	NE 5th St	3.50		335	B	MO	Patching	15.0%	Level Up	base at edge of parking should be tested prior to overlay, may consider narrowing pavement section
Bishop Street	NE 9th St	Tiger Dr	4.00		70	B	HMAC	RIP			
Bluff Street	Shade	220' NE	4.00		209	HMAC	P			Crack Seal	Low volume roadway, significant cracking
Brown Primary School St.	SW 5th St	SW 7th St	4.26		598	HMAC	MO	Patching	10.0%		
Bruner Blvd	End	Harper St	5.00		217	B	CS	RIP			
Bruner Blvd	Harper	Bruner	3.75		327	B	CS	RIP			
Bunte Street	SE 4th St	End	3.73		1559	HMAC	P	Patching	5.0%	Crack Seal	Turns to private drive at end, low volume road - CS Candidate - serves private neighborhood
Colorado Street	Alley	Burleson St	3.57	Y	224	HMAC	P	Patching	20.0%	Crack Seal	primarily patching along the northern curbline, significant edge failure
Colorado Street	Charleston Blvd N	Charleston Blvd S	3.83		54	HMAC	P	Patching	5.0%	Crack Seal	Crack sealing may be required beyond this intersection
Faulkner Road	3rd St	Oak Meadow Dr	3.65		593	HMAC	MO	Patching	5.0%	Crack Seal	
Garwood Street	3rd St	NE 4th St	3.67		345	B	HMAC	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Gresham Street	3rd St	NE 4th St	3.86		346	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Gresham Street	NE 4th St	NE 5th St	3.91		336	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Gresham Street	NE 5th St	NE 6th St	3.97		343	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Gresham Street	NE 6th St	NE 7th St	4.03		343	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Gresham Street	NE 7th St	NE 8th St	3.95		420	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Harper Street	North St	Bruner	4.12		777	B	CS	Patching	20.0%	Crack Seal	South 150' RIP
Hickory Street	7th Ave	End	4.14		438	B	P	Patching	5.0%		Low volume roadway
Hickory Street	2nd Ave	3rd Ave	4.91		325	CS	P	Patching	5.0%		
Hickory Street	3rd Ave	4th Ave	3.91		327	CS	P	Patching	5.0%		Vegetation removal and street cleaning needed
Hickory Street	7th Ave	4th Ave	4.39	Y	592	B	CS	RIP			Low Water Crossing, may be candidate for concrete reconstruction of low water crossing
Hill Street	NE 8th St	Loop Rd	3.70		1958	B	CS	RIP			
Hudgins Street	NE 1st St	NE 2nd St	4.19		343	CS	CS	RIP			
Hudgins Street	NE 2nd St	3rd St	3.74		339	CS	CS	Patching	10.0%		Vegetation removal and street cleaning needed
Hudgins Street	NE 4th St	NE 5th St	3.86		338	CS	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Hudgins Street	NE 5th St	NE 6th St	3.83		341	CS	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Hudgins Street	NE 6th St	NE 7th St	3.74		342	CS	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Hudgins Street	NE 7th St	NE 8th St	4.03		339	CS	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed

City of Smithville											
Street Maintenance Plan											
Street Segment	From	To	2019 Roadbotics Quality	Potential Drainage Issues	Length (FT)	Existing Surface	Proposed Treatment	Base Repair	Patching Percentage	Other Preparation	Notes
Hudgins Street	NE 8th St	NE 9th St	4.03		341	CS	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Hudgins Street	NE 9th St	Colorado St	3.94		351	CS	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Ken Blaschke Drive	SE 4th St	Driveway	3.67		53	B	P	Patching	20.0%		short section of roadway - CS candidate to be combined with additional length of Ken Blaschke Dr
Lueders Lane	Oak Meadow Dr	End	3.74		266	B	CS	Patching	5.0%		low volume roadway, cul-de-sac
Maple Street	5th Ave	Dump Ground Rd	3.76		160	CS	P	Patching	5.0%		
Maple Street	6th Ave	5th Ave	4.00		317	CS	P	Patching	5.0%	Crack Seal	Low volume roadway
Maple Street	End	6th Ave	4.33		276	CS	P	Patching	5.0%		Low volume roadway
Martin Luther King Dr.	Alley E of	Walker St	3.94		178	HMAC	P	Patching	15.0%	Crack Seal	Consider future MO
Mills Street	NE 2nd St	3rd St	4.50		345	B	MO	Patching	10.0%		Roadside parking and striping along this roadway. Ped ramp extends into parking from ramp.
Mills Street	3rd St	NE 4th St	3.69		345	CS	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Mills Street	NE 5th St	NE 6th St	4.46		340	HMAC	HMAC	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Mills Street	NE 6th St	NE 7th St	4.47		340	HMAC	HMAC	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Mills Street	NE 7th St	NE 8th St	3.97		339	HMAC	HMAC	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Mills Street	NE 8th St	NE 9th St	4.08		345	HMAC	HMAC	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Northeast 7th Street	Alley W of	Burleson St	3.84	Y	170	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Burleson St	Alley E of	3.94		172	B	P			Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Alley W of	Hudgins St	4.00		171	B	P			Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Hudgins St	Alley E of	4.00		170	B	P			Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Alley W of	Short St	3.74		172	B	P			Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Short St	Alley E of	3.94		168	B	P			Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Alley W of	Mills St	4.06		165	B	P			Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Mills St	Alley E of	4.06		173	B	P			Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Alley W of	Garwood St	3.83		171	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Garwood St	Alley E of	3.95		174	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Northeast 7th Street	Alley W of	Bishop St	3.71		166	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Northeast 8th Street	Olive St	Alley E of	3.57		210	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Northeast 8th Street	Alley W of	Gresham St	3.50		170	B	P	Patching	5.0%	Crack Seal	Vegetation removal and street cleaning needed
Northeast 8th Street	Gresham St	Alley E of	4.75		171	B	CS	Patching	10.0%	Crack Seal	Vegetation removal and street cleaning needed
Northeast 8th Street	Alley W of	Burleson St	4.22		167	B	CS	Patching	10.0%	Crack Seal	Vegetation removal and street cleaning needed
Northeast 8th Street	Burleson St	Alley E of	4.82	Y	175	B	CS	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Northeast 8th Street	Alley W of	Hudgins St	4.63	Y	171	B	CS	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Northeast 8th Street	Hudgins St	Alley E of	4.78		168	B	CS	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Northeast 8th Street	Alley W of	Short St	3.84		174	B	CS	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Northeast 8th Street	Alley W of	Mills	3.50		170	HMAC	P			Crack Seal	
Northeast 8th Street	Dorothy Nichols Rd	Hwy 71	3.50		108	B	P			Crack Seal	appears to be partially TxDOT ROW
Northeast 8th Street	Hwy 71	Hill St	4.31		951	B	CS	RIP			may widen roadway while rebuilding
Northeast 9th Street	Burleson St	Alley E of	4.22		175	HMAC	HMAC	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section

City of Smithville											
Street Maintenance Plan											
Street Segment	From	To	2019 Roadbotics Quality	Potential Drainage Issues	Length (FT)	Existing Surface	Proposed Treatment	Base Repair	Patching Percentage	Other Preparation	Notes
Northeast 9th Street	Alley W of	Hudgins St	4.50		166	HMAC	HMAC	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Northeast 9th Street	Hudgins St	Alley E of	4.22		170	HMAC	HMAC	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Northeast 9th Street	Alley W of	Short St	3.74		173	HMAC	HMAC	RIP			base along edge of parking area - not paved to curb, may consider not paving to curb and narrow section
Olive Street	NE 5th St	NE 6th St	3.72		342	CS	P	Patching	5.0%	Crack Seal	
Olive Street	NE 6th St	NE 7th St	3.97		343	CS	P	Patching	5.0%	Crack Seal	
Olive Street	NE 7th St	NE 8th St	4.00		310	CS	P	Patching	5.0%	Crack Seal	
Pecan Shores Drive	Y	500' N of Y	4.38		509	HMAC	CS	RIP			
Pecan Shores Drive	Upton-Smith	Y	3.59		552	HMAC	CS	RIP			
Pine Street	4th Ave	3rd Ave	4.23		329	B	CS	Patching	10.0%		
Pine Street	5th Ave	4th Ave	4.31		328	B	CS	Patching	5.0%		
Ramona Street	NW 6th St	End	3.87		389	B	CS	Patching	5.0%	Crack Seal	needs new chip seal, appears to have old chip seal not adhering
San Jacinto Street	SE 2nd St	End	3.50		241	HMAC	CS	Patching	5.0%	Crack Seal	Low volume road, edge paving not consistent - parking area
Southeast 1st Street	Gentry St	Bunte St	3.97	Y	326	CS	P	Patching	15.0%	Crack Seal, Level Up	vegetation removal, appears to have ponding issues in Gentry St intersection near Apts. Level Up
Southeast 4th Street	Washington	Alley	3.89		182	HMAC	MO	Patching	5.0%		
Southeast 6th Street	Alley E of	Yeager	4.00		184	HMAC	P	Patching	5.0%	Crack Seal	Low volume road - CS Candidate
Southeast 6th Street	Yeager	Alley W of	3.61		166	HMAC	P	Patching	5.0%	Crack Seal	Low volume road - CS Candidate
Southeast 6th Street	Alley E of	San Jacinto St	4.35		163	HMAC	P	Patching	10.0%	Crack Seal	edge patching - Low volume road - CS Candidate
Southwest 2nd Street	Prima St	End	4.11		159	B	CS	Patching	5.0%		Appears to be used as private drive, do nothing - otherwise CS candidate due to low volume road
Southwest 4th Street	Alley	School Road	4.08		114	HMAC	HMAC	RIP			
Southwest 4th Street	Alley	Washington	3.53		181	HMAC	MO	Patching	5.0%		
Taylor Street	SE 6th St	SE 5th St	3.94		336	CS	CS				needs new chip seal, appears to have old chip seal not adhering
Tiger Drive			5.00		356	B	HMAC	RIP			narrow roadway, may need to widen
Upton-Smithville Road	FM 2571	Shade St	3.69		507	B	CS	Patching	5.0%		
Whitehead Street	NE 1st St	NE 2nd St	3.76		340	CS	P	Patching	10.0%	Crack Seal	
Whitehead Street	NE 8th St	Alley	4.16		440	B	HMAC	RIP			
Whitehead Street	Alley	Charleston Blvd	3.83		169	B	HMAC	RIP			

Existing Surface Column: Indicates surface type as follows HMAC - Asphalt Pavement, CS - Chip Seal, B - Hybrid of types (unknown), C - Concrete, D - Dirt

Proposed Treatment Column: Indicates maintenance type, P - Preservation, CS - Chip Seal, MO - Mill and Overlay, HMAC - Asphalt, N - None

Base Repair Column: RIP is Replace in Place with Reclamation optional