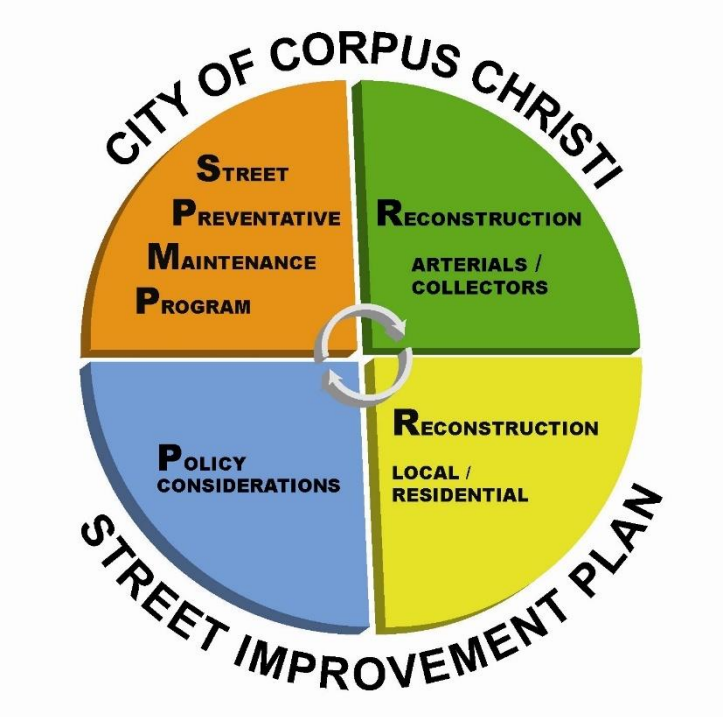
Street Preventative Maintenance Program (SPMP)
Update & 2019 Work Plan

Council Presentation
May 21, 2019

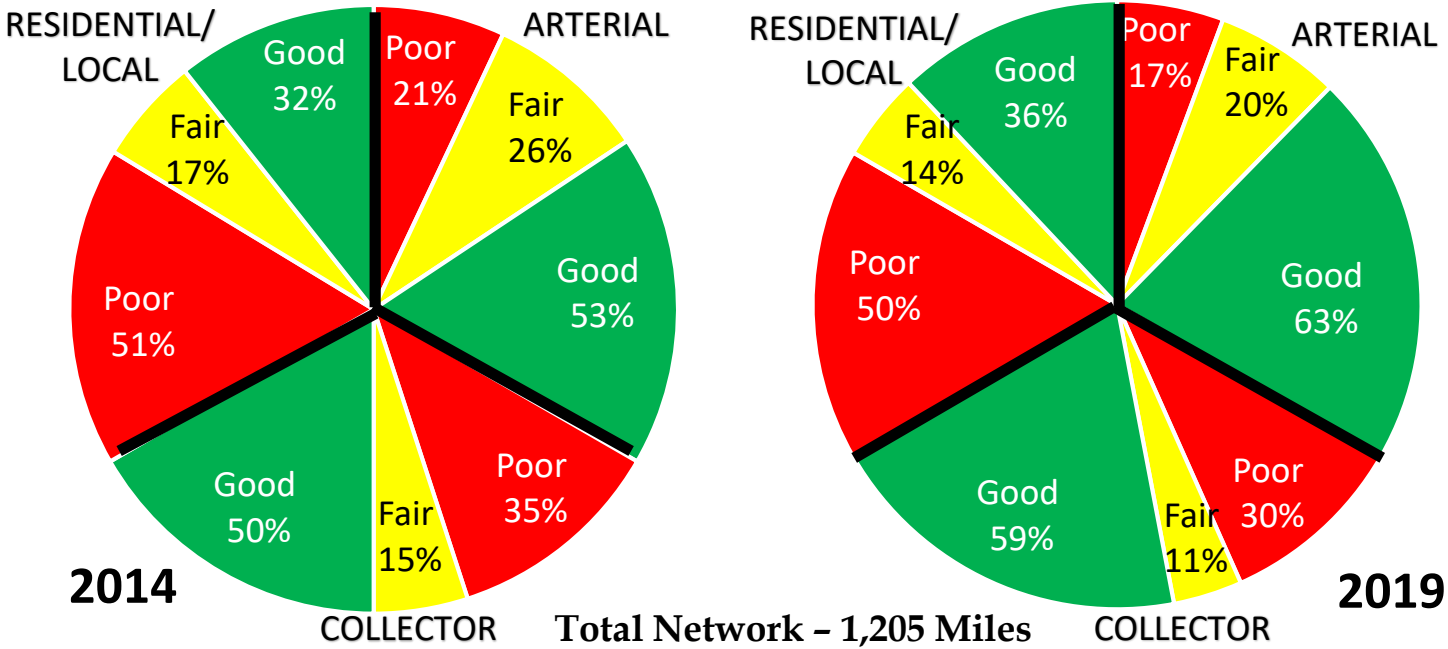
Street Improvement Plan (SIP)

Street Preventative Maintenance Program (SPMP)



$15.3 M / Year

Total Street Network
(Total 20M Square Yards)



Total Network – 1,205 Miles

- 159 Miles Arterials (13%)
- 211 Miles Collectors (18%)
- 835 Miles Residential/Locals (69%)

Street Condition Assessment & Inventory

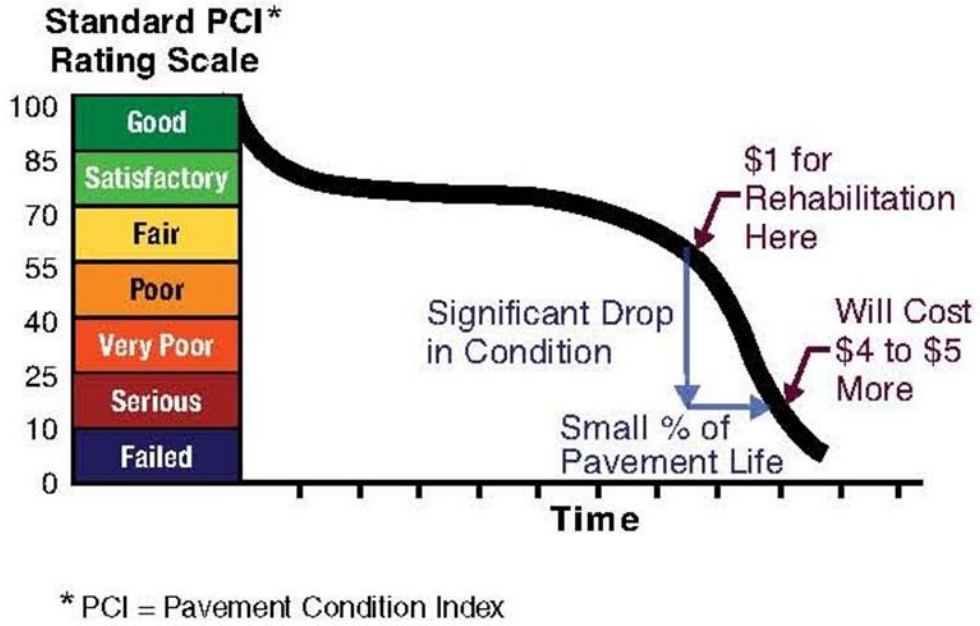
- **Pavement Condition**
  - **Micro-PAVER uses 20 pavement distresses in condition surveys:**
    - ✓ *Alligator cracking, rutting, potholes, block cracking, corrugation, bleeding, raveling, shoving, slippage cracking, joint reflection cracking, depression, edge cracking, bumps & sags, railroad crossing, patching & utility cut patching, swell, weathering, polish aggregate, shoulder drop off, longitudinal & transverse cracking.*

- **Pavement Condition Index (PCI):**
  - PCI's are calculated using:
    - ✓ each of the pavement distresses observed;
    - ✓ density/quantity of each; and
    - ✓ severity level of each.
  - PCI calculated value:
    - ✓ is a weighted composite index of each pavement distress observed and deduct value for each; and
    - ✓ is used to identify pavement maintenance & rehabilitation treatment candidates (i.e. reconstruction, overlay, seal coat).

- **Data Collected on a 2-Year Cycle** (TransMap)

Standard Pavement Deterioration Curve

- **Pavements should be managed, not simply maintained.**



* PCI = Pavement Condition Index

Chart from NAPA report: A New Transportation Commitment for America (2007)

Current Citywide Street Maintenance SPMP Years 1-5

- **Program started in 2014 with the following parameters:**

PREVENTATIVE MAINTENANCE		
SPMP (Contracted)		**City Street Operations**
OVERLAYS	**SEAL COATS**	**SEAL COATS**
Streets w/ PCI ~ 56	Streets w/ PCI ~ 71	Streets w/ PCI ~ 71
75% of Funding	25% of Funding	Operating Budget
ADA Improvements	Minimal Curb & Gutter Imp.	Minimal Curb & Gutter Imp.
Performed Year round	Subject to weather conditions	Subject to weather conditions

5-Year Summary

		2014 (Year 1)	2015 (Year 2)	2016 (Year 3)	2017 (Year 4)	2018 (Year 5)	5-Year Total
Overlay (Contractor)	# Streets	58	45	62	40	47	252
	Square Yards	289,903	199,949	303,170	263,961	238,965	1,295,948
	Miles	17	14	22	14	14	81
Seal (Contractor)	# Streets	84	53	96	39	39	311
	Square Yards	430,775	216,280	332,007	202,636	238,217	1,419,915
	Miles	26	15	24	17	11	93
Seal (City)	# Streets	64	52	85	68	77	346
	Square Yards	350,028	274,331	353,045	290,350	365,488	1,633,242
	Miles	21	19	25	20	20	105
Total	**# Streets**	206	150	243	147	163	**852**
	Square Yards	1,070,706	690,560	988,222	756,947	842,670	**4,122,298**
	Miles	64	48	71	51	45	**272**

PERCENT OF STREET NETWORK MAINTAINED (BY CLASS)				
	Arterials	Collectors	Residential	Total Network
Over 5 Years:	26%	24%	17%	20%

Current Status

Work Plan % Completion

Program Year	2014-2016	2017	2018
Overlay (Contract)	100%	100%	31%
Seal (Contract)	100%	42%	0%
Seal (City Ops)	100%	100%	100%

SPMP Lessons Learned

- Seal Coats Problematic on High Volume Roads (Arterials & Collectors)
  - ✓ Increased traffic loads, vehicle speeds, & turning motions loosen aggregate
    - Reduces Seal's Performance (skid resistance & longevity)
    - Creates Potential Windshield Hazards
  - ✓ Inconsistent Results & Success with CONTRACTED Seals
  - ✓ Exceptionally Sensitive to Application
    - Rates (aggregate & emulsion),
    - Weather,
    - Existing Pavement Condition, etc.
  - ✓ Lifecycle 6-8 years, Potentially Reduced
    - Construction Quality & Aggregate Losses

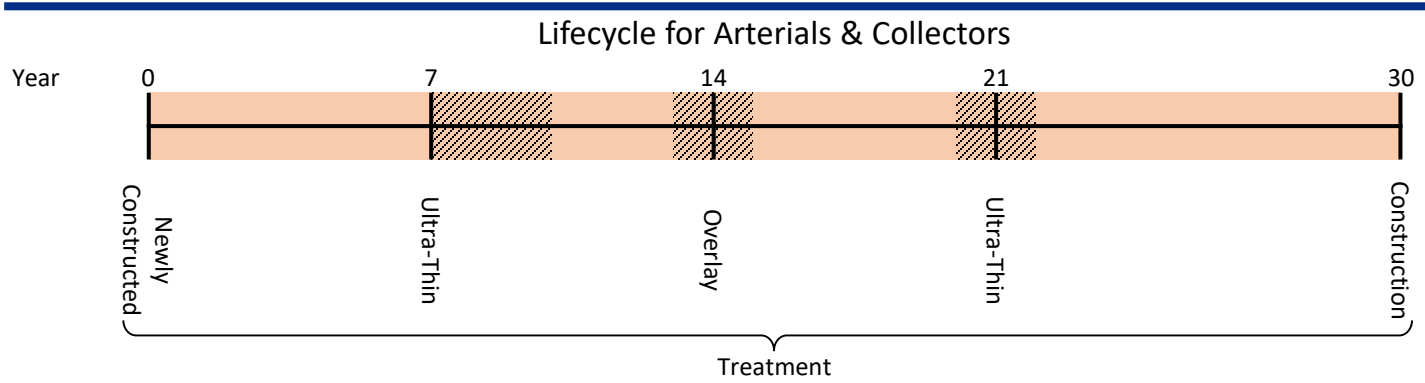
Recommended Program Changes

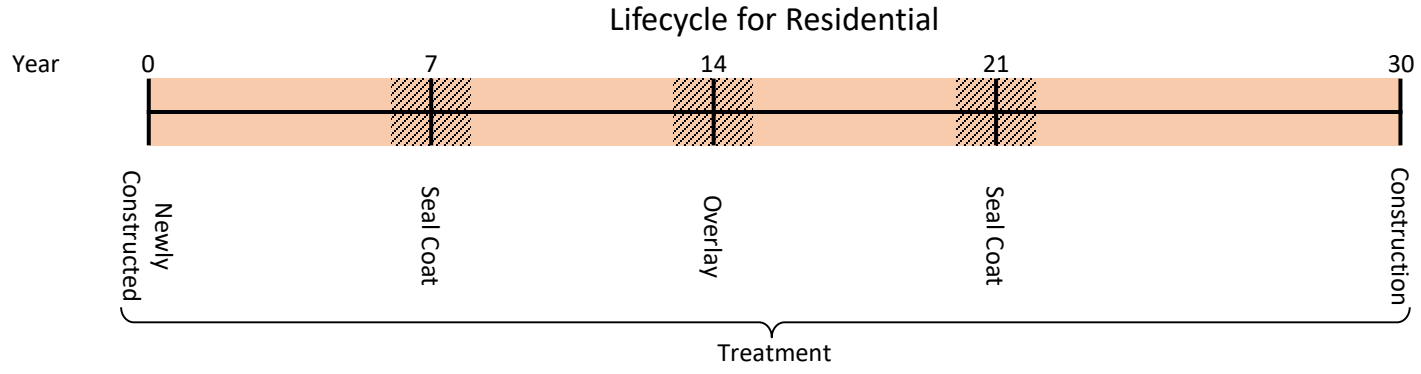
- Arterials Streets
  - ✓ Overlay (Contracted)
  - ✓ Ultra-Thin Bonded Wearing Coarse (Contracted)
  - ✓ No Seal Coats
- Collector Streets
  - ✓ Overlay (Contracted)
  - ✓ Ultra-Thin Bonded Wearing Course (Contracted)
  - ✓ No Seal Coats
- Residential/Local Streets
  - ✓ Overlay (Contracted)
  - ✓ Seal Coat – In House City Operation (No Contracted)
  - ✓ No Ultra Thin

Seal Coat vs. Ultra-Thin
Bonded Wearing Coarse Comparison

COMPARISON FACTORS	SEAL COAT	ULTRA-THIN
Lifecycle	6 - 8 years	7 - 10 years
Cost	$18/SY	$25/SY
30-Yr Lifecycle Cost	$27,600,000	$29,000,000
Ride Quality	Low	High
Loose Rock/Dust	High	Low
Project Length	Unrestricted Lengths	Requires minimum 500LF (not practical for residential sections)

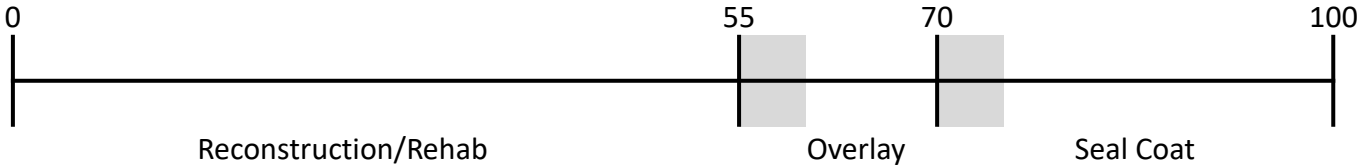
Pavement Treatment
30-Year Lifecycle



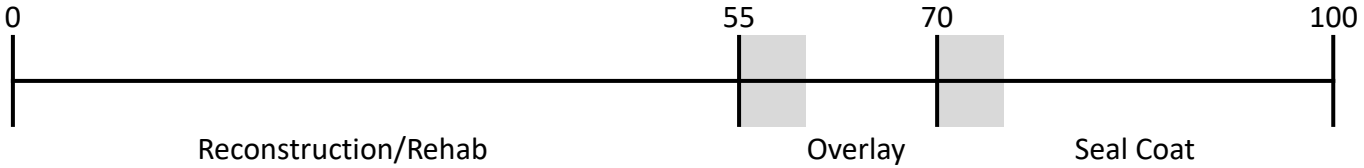


Pavement Treatment
By PAVEMENT CONDITION INDEX

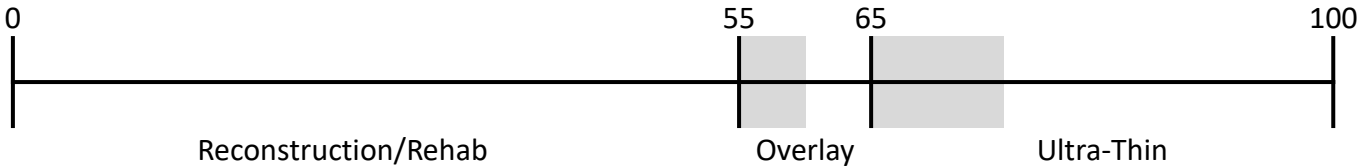
CURRENT PROGRAM **Residential, Collectors & Arterials**



PROPOSED **Residential**



Arterials & Collectors



Target PCI Range

Proposed Citywide Street Maintenance

PREVENTATIVE MAINTENANCE			
SPMP Budget			Operating Budget
CONTRACTED		CITY STREET OPERATIONS	
OVERLAYS	ULTRA-THIN	SEAL COATS	
60% of Funding	30% of Funding	10% of Funding	Operating Budget
Streets w/ PCI ~ 56	Streets w/ PCI ~ 65	Streets w/ PCI ~ 71	
ADA Improvements	Minimal Curb & Gutter Imp.	Minimal Curb & Gutter Imp.	
Performed Year round	Limited impact by weather	Sensitive to weather conditions	
1-½" to 2" Thick	½" to ¾" Thick	½" Thick	
Avg - $50/SY	Avg - $25/SY	Avg - $18/SY	

- Arterials treated with Overlay or Ultra-Thin (contract)
- Collectors treated with Overlay or Ultra-Thin (contract)
- Residential/Locals treated with Overlay (contract) or In-House Seal Coat

Summary of Program Changes
Benefits

- Discontinue **CONTRACTED** Seal Coat Treatment on Arterial/Collectors
- Addition of Ultra-Thin Treatment on Arterials & Collectors
  - ✓ More substantial treatment on high volume streets
  - ✓ Increased ride quality & performance (skid resistance & longevity, road noise)
  - ✓ Reduced dust & loose rock (aggregate)
  - ✓ Extended maintenance cycle (7-10 years)
  - ✓ Reduced schedule impacts due to weather
  - ✓ Does not trigger ADA (concrete work)
- Discontinue Contract Seal Coat Treatment
  - ✓ City Street Ops Perform all Seal Coats on Residential/Local Streets
- Maintains SYs of pavement preservation

Plan to Complete
2017 & 2018 Remaining Work Plans

Program Year	2014-2016	2017	2018
Overlay (Contract)	100%	100%	31%*
Seal Coat (Contract)	100%	42%*	0%**
Seal Coat (City Ops)	100%	100%	100%

* To be completed by existing contracts

**Residential streets will be seals completed by Street Operations; Arterials & Collectors will be contracted Ultra-Thin

2019 (Year 6) SPMP Work Plan

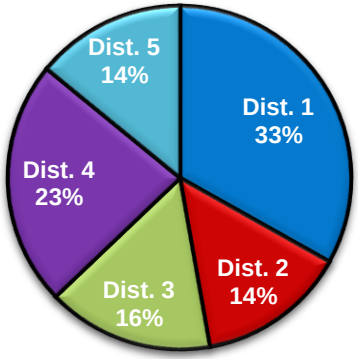
SPMP Street Selection Criteria

1. Work based on **Pavement Condition Index** (PCI) scores:
   - ✓ Approximately - 56 for Overlays, **65 for Ultra-Thin**, & 71 for Seal Coats
   - ✓ Prioritize streets closest to:

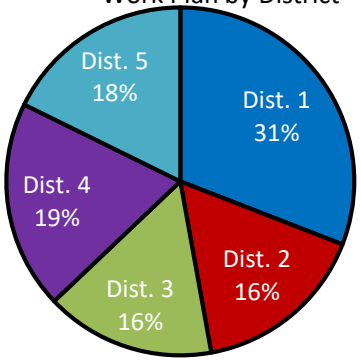
     56 for Overlays, **65 for Ultra-Thin** and 71 for Seal Coats
2. Work **Distributed by District** based on Capital Assets needing Maintenance (% of Network)
3. Work **Distribute by Street Classification** (Residential, Collectors & Arterials) based on Capital Assets (% of Network)
4. **Coordinate work** for Residential by Neighborhood and initial subdivision construction dates
5. **Distribute work** by percentage of Overlay, Ultra-Thin and Seal Coats
6. **Prioritize by traffic loads** causing potential premature failure of roadway

2019 (Year 6) Work Plan Target

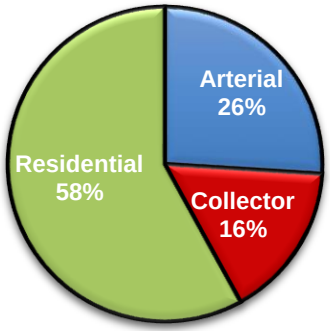
Need by District



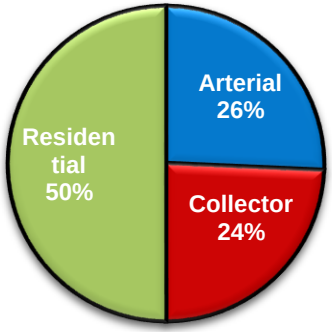
Work Plan by District



Need by Road Classification



Work Plan by Road Class



Target percentages based on Square Yards of Pavement in each District/Category relative to the total City System.

Proposed 2019 (Year 6) SPMP Work Plan - $15.3 M / Year

	Overlays	Ultra-Thin	Street Ops Seals	Total
Streets Maintained	51	20	123	**194**
SYs	207,431	207,667	406,792	**821,890**
Linear Miles	12	8	24	**44**
% Arterial	20%	82%	0%	
% Collector	18%	18%	0%	
% Residential/Local	62%	0%	100%	

6-Year Program Summary
with Recommended Changes

		2014 (Year 1)	2015 (Year 2)	2016 (Year 3)	2017 (Year 4)	2018 (Year 5)	2019 (Year 6)*	6-Year Total
Overlay	# Streets	58	45	62	40	47	51	303
(Contractor)	Square Yards	289,903	199,949	303,170	263,961	238,965	207,431	1,503,379
	Miles	17	14	22	14	14	12	93
Seal	# Streets	84	53	96	39	39	0	311
(Contractor)	Square Yards	430,775	216,280	332,007	202,636	238,217	0	1,419,915
	Miles	26	15	24	17	11	0	93
Ultra-Thin	# Streets						20	20
(Contractor)	Square Yards						207,667	207,667
	Miles						8	8
Seal	# Streets	64	52	85	68	77	123 **	469
(City)	Square Yards	350,028	274,331	353,045	290,350	365,488	406,792 **	2,040,034
	Miles	21	19	25	20	20	24 **	129
Total	**# Streets**	206	150	243	147	163	194	**1,103**
	Square Yards	1,070,706	690,560	988,222	756,947	842,670	821,890	**5,170,995**
	Miles	64	48	71	51	45	44	**323**

PERCENT OF STREET NETWORK MAINTAINED (BY CLASS)				
	Arterials	Collectors	Residential	Total Network
Over 6 Years:	31%	29%	20%	24%

* Additional funds added from Bond ADA funds

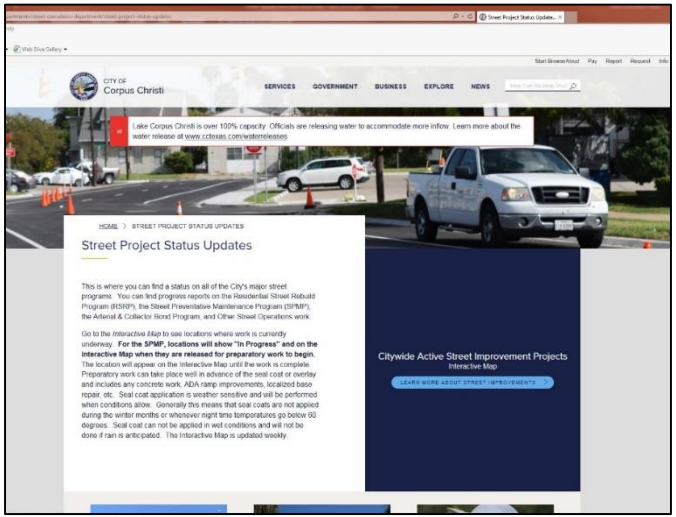
** Includes Residential/Local Seal Coats (120k SY) funded from SPMP, to be done by Street Operations

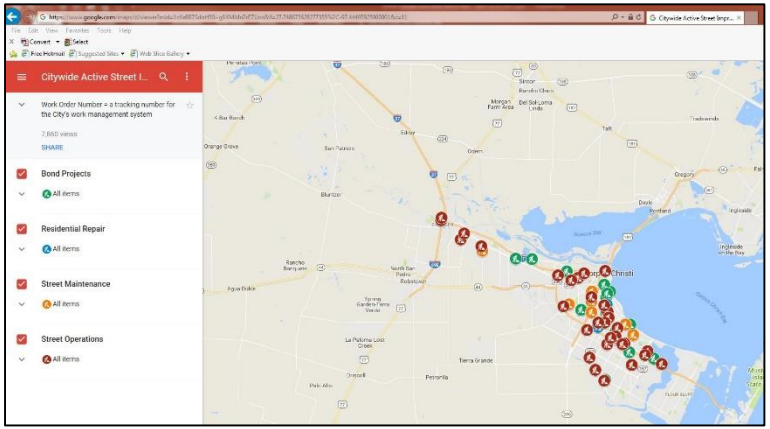
Next Steps

- Approve 2019 Work Plan (Resolution – This Item)
- Approve AE Contract Amendment (Separate Item)
  - ✓ For Delivery Order Development

SPMP Program Status

- Website for Program status reports:
  https://www.cctexas.com/street-project-status





Questions?

Extending the life of our streets.