



Public infrastructure provides the foundation on which our community is built. Street overlays, sidewalk installations, ditch-cleaning, water-production and purchases, and new project completions are some of the main functions provided by the city to ensure effective growth, support and maintenance of public infrastructure. These items are somewhat the unsung heroes of a community. When they are working great, they are seldom noticed. A growing city like Pearland is still strengthening its “bones” of roads and utilities, and must balance the immediate maintenance needs with the importance of looking ahead.

The City uses a combination of hired professional staff and executives, contractors, professional service-providers and technical resources to manage and complete the activities that give our residents the ability to move about the City effectively, receive clean and safe drinking water, properly discard of waste, and prevent flooding in our streets, neighborhoods and retail nodes during heavy rains and storms.

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# FY22 White Paper

To: Clay Pearson, City Manager

From: Clarence Wittwer, Director of Public Works

CC: Trent Epperson, Assistant City Manager  
David Van Riper, Assistant Director of Public Works  
Eric Hammond, Assistant Director of Public Works

Date: December 15, 2020

Re: Streets & Sidewalks Investment (Update)



## **Background:**

The intent of this memo is to provide an update on the prior year Streets & Sidewalks Investment White Paper dated January 31, 2020.

In FY20, City Council adopted a Budget which restored the street and sidewalk reinvestment programs to \$1,104,522. and \$701,266. respectively.

Budget dollars in FY20 are to accomplish reinvestment in the existing street and sidewalk networks to improve mobility, reduce degradation in the pavement condition index, and sustain commuter safety. However, COVID-19, a broadscale pandemic impacted the Pearland community and the country in March of 2020, severely impacting the ability to maintain adequate staffing levels, safely conduct maintenance operations and secure both materials & contracted services for extended periods of time. Because of the pandemic, Brazoria County, whom we partner with under an interlocal agreement are also severely affected. County realized staffing shortfalls and schedule conflicts, resulted in their inability to assist in interlocal paving work scheduled for FY20, until FY21. As such, decreases in completion of planned work were realized in all maintenance services and the full budget allocation was not utilized.

In addition to the obstacles presented by COVID 19, the Public Works Department spent much of the year understaffed due to turnover, suffered multiple equipment failures, and underwent a reorganization to provide long-term service level improvements and provide a complete streets approach to right of way management. The internal organizational change included the merger of streets and drainage services into the Right of Way Division which historically provided more traditional right of way services such as landscape management, pavement marking, traffic sign management, utility locates & permitting as well as general aesthetic and enhancement services. The merger was conducted in the fourth quarter of FY2020 (July) and placed all management under a single chain of command.

The above impacts *resulted in minimal reinvestment of only \$190,550 (17%) in streets and \$386,093 (55%) in sidewalks.* A positive is that in FY 19 a dedicated streets and sidewalks asset fund had been established and those monies remain earmarked and ready for use to that purpose.

Despite these challenges, the follow list captures several of the improvements made to the pavement network and related services in FY20.

### Streets:

- Through the use of contracted services, reclamation and overlay of 1.19 miles ft of asphalt road on O'Day RD at a cost of \$80,371
- Using in-house services, filled 3,304 Potholes

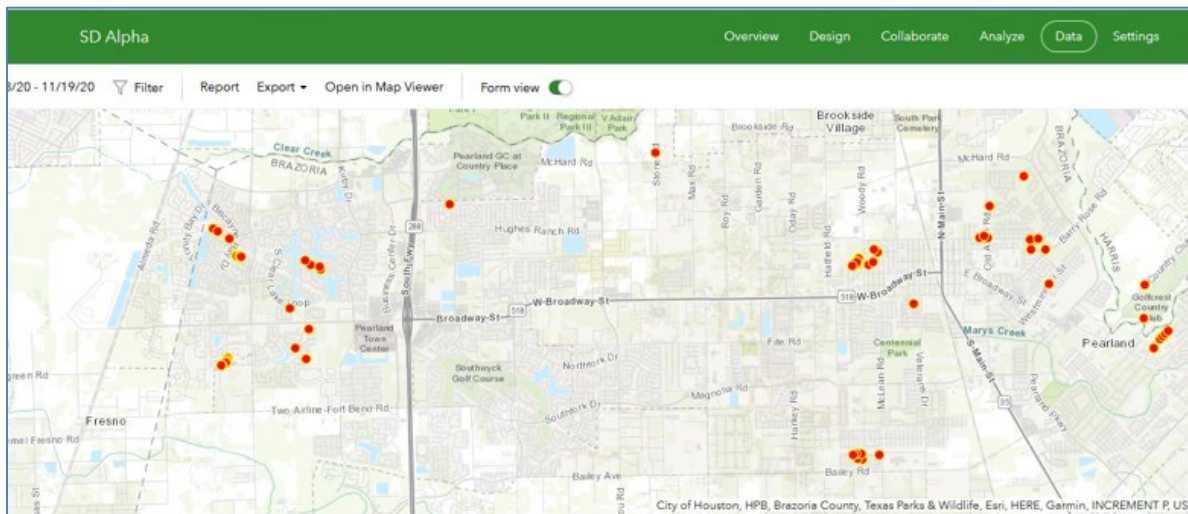
### Sidewalks:

- .65 Miles (3,448.18 linear feet) of sidewalk was removed and replaced at a cost of \$114,561.
- 406.95 Inch Foot (In-Ft) of sidewalks sliced to remove trip hazards at a cost of \$20,348.
- 83,729 ft<sup>2</sup> of sidewalks mud raised at a cost of \$251,184.
- 992 Sidewalk work requests closed.

### General Accomplishments:

- The Right of Way (ROW) Division successfully merged the street and drainage services with the traditional right of way management services to form a new unified ROW Division, tasked with providing a complete streets approach to right of way management.
- The Division, in conjunction with the IT-GIS Division and many other business partners developed an innovative way of capturing and documenting damage assessment throughout hurricane and storm related events.
- *Developed a Sidewalk Repair Policy that outlines the qualifications and prioritization of sidewalk repair needs.* This policy is now used in place of subjectivity and includes criteria such as life safety; pedestrian use; connectivity and work order aging to determine the severity, priority and repair method of the sidewalk network. In conjunction with this policy, the Division designated maintenance zones to more equitably utilize the sidewalk repairs funds across the community. These zones dissect the community into five areas and allow equal budget dollars to be invested based on policy determination. Past practice could exhaust most of an annual operations budget within a single subdivision and not allow for service provision City wide.
- Developed and implemented a work order submission and tracking tool Survey 123, used to identify, record, track and geo locate needed or completed work conducted along street and drainage infrastructure. Below is an image from the Division's new sidewalk tracking application.

## Image from Work Order Tracking Application



### Shift in Strategy – Brazoria County Inter-local Agreement:

In FY20, to further the maintenance of the pavement network, the City partnered with Brazoria County to expand the services of the Inter-local Agreement. That expansion included *revising the scope of joint pavement services within the City*. Historically, pavement support from Brazoria County was received in the form of asphalt overlay services on roads where City staff previously completed necessary base repairs and committed to provide all traffic control services throughout the duration of the overlay project. This method of providing municipal base repairs and all traffic control services, taxed staffing resources for an extended period before and through the duration of the project

City staff met with the County paving operations team and County engineer to review the status of the program and shift to County provided *full depth reclamation with no assistance from the City except for funding and coordinating a contracted traffic control company to perform traffic control and flagging throughout the duration of the project*. The new strategy allows City staff to focus on planned in-house paving, drainage maintenance and sidewalk repair work. The County agreed to provide full depth reclamation for asphalt roadways when needed at a rate of one third (1/3) the miles receiving asphalt overlay services, due to the added cost and time necessary to provide this full-depth service.

It should be acknowledged that 1/3 of the County operating and road/bridge mileage revenue comes from residents and businesses within the incorporated City of Pearland portion of Brazoria County and (separate from the Road and Bridge fund) sales tax revenue from incorporated areas within Brazoria that are also within the City of Pearland. As such, the City of Pearland currently receives more asphalt paving services than any other city within the county. On average, *the City receives three times the annual pavement services provided to competing municipalities*.

Lastly a modification to the inter-local agreement is in the works to allow City staff to utilize County paving equipment, free of charge, on City projects with the understanding that the City will fund any necessary repairs to loaned equipment while in the City's possession. Brazoria County is resourced with a robust asphalt services fleet and specialty tools that are oftentimes challenging for the City to acquire. *Thanks to the good road cooperation with Brazoria County, the loan program under the current inter-local can provide these necessary resources to the City for in-house operations, without the initial purchase cost and long-term maintenance costs for equipment we cannot utilize on a regular basis.*

Unfortunately, due to COVID-19, concurrent major restructuring of the streets & drainage division resulting in a completely new leadership team, and scheduling conflicts for Brazoria County to begin paving operations within the Pearland community, interlocal paving was postponed until the final days of FY20. Stone Road and Harkey Road were selected for the FY20 interlocal paving plan with the combined lengths of these roads equaling the 1/3 annual allowance of full depth services when compared to traditional asphalt overlaying. (On average, the City receives 5-6 miles of asphalt overlay services annually. However, when more substantial road repairs are necessary, the City receive full depth reclamation services which involve the milling and restoration of base failures prior to overlaying with asphalt. Based on the requirement for additional resources when full depth reclamation services are provided, one mile of full depth reclamation is equal to three miles of asphalt overlay) Stone Road was the first to be completed under this new agreement and did not begin until September 29, 2020 and was completed November 25, 2020.

Due to the unprecedented challenges of 2020, City staff again provided in-house traffic control for this project which impacted most of the Division’s staff resources for a period of two (2) months. Harkey Road is currently underway.

**FY20 Programmed Street Work:**

To more appropriately align the City’s limited street maintenance resources, the FY20 budget was funded at \$1,104,522. for street related activities. As mentioned above and in previous pavement memos, a majority of the roadwork competed in FY 20 occurred on O’Day Road, which underwent a delayed restoration process due to prolonged equipment failures and a impacts from a Tropical Storm that undermined repair efforts and ultimately required the support a resourced contractor to complete the repairs. The following tables identify the street maintenance work planned for FY20 and programmed approach to invest back into the pavement infrastructure. As indicated in the column to the right of each section, the status of each planned project illustrates the magnitude of the impact COVID-19 as well as plagued equipment failure on the completion of the annual work plan.

**I. In-house planned work**

<b>Street</b>	<b>To</b>	<b>From</b>	<b>PCI</b>	<b>Length</b>	<b>Width</b>	<b>Status</b>
<b>Laurie St</b>	Garden Rd	O'Day Rd	37	2028	20	Incomplete
<b>Lazy Bend</b>	Gardenia	Broadway	36	1440	21	Incomplete
<b>Thelma St</b>	Gardenia	Broadway	62	1235	19	Incomplete
<b>Gardenia</b>	O'Day	Garden Rd	40	2019	18	Incomplete
<b>Knapp Rd</b>	Dead End	Main St.	33	2700	20	Incomplete
<b>Alice St</b>	Profax	Main St.	42	1403	28	Incomplete
<b>Zychlinski Dr</b>	Grand Blvd	Park Ave		305	30	Incomplete
<b>S. Houston Ave</b>	Walnut	Broadway	29	1230	18	Incomplete

<b>Rayburn</b>	Dead End	Dixie Farm Rd	32	872	14	Incomplete
<b>Hawk</b>	Cullen Rd	Norfolk	63	2629	22	Incomplete
<b>Hillhouse</b>	Dead End	Hughes Ranch Rd.	52	2086	20	Incomplete
			3.40	Miles		

## II. County Turnkey (full-depth) Reclamation and Paving

Street	To	From	PCI	Length	Width	Status
Stone Rd.	Hughes Ranch Rd	Brookside Dr	51	7800	20	Complete
Harkey	Bailey Rd	Magnolia	58	4545	29	In process

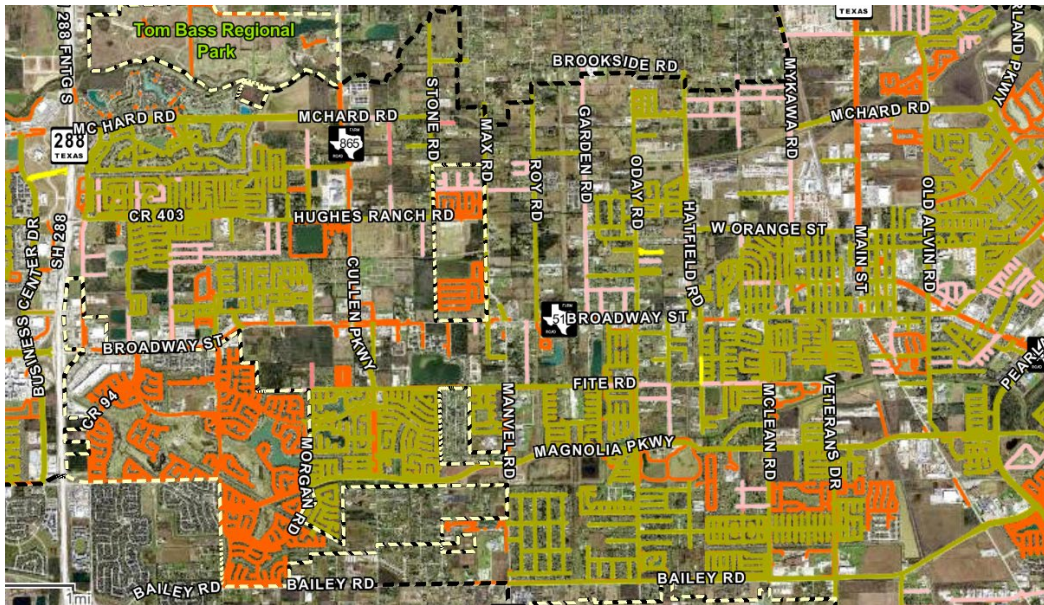
2.34 Miles

## III. Curb Repair and Crack Seal Program

Two additional street related programs that were planned for FY20 include the development of a curb repair and replacement program to address the increasing number of broken curbs in the city as well as the development of crack seal program to maintain current streets.

- The *curb repair* program remains in development, however, since the transition of this program to the Right of Way Division, staff have already made monumental strides in development of a curb management program. The initial step was to leverage the power of the IMS survey and quantify all curbing within the network. Data was mined from past infrastructure audits and all curbing as well as the condition was plotted on a GIS mapping system. The condition of the curb network ranges from very good, good, fair, poor and very poor. The team then divided the community into program zones for management and routing purposes. Next steps in the development of the curb repair program, which are planned for third quarter FY21, is to develop a curb repair policy and initiate a contract for outsourced repairs. Below is an image from the curbing condition layer housed on the City's GIS system.

## Curb Inventory & Condition Image



- *Crack sealing* is essential for preventing moisture from undermining the base of City streets. The Division acquired its first crack sealing machine in January of 2021. While in the early stages of program development, staff intend to leverage the data provided by the IMS survey to identify specific locations throughout the pavement network that would benefit from this sealing services. As listed further within the memo, staff intend to partner with RoadBotics for the purchase of in-house pavement surveying system. The RoadBotics tool allows staff to drive a desired roadway and record the pavement surface. The video is then run through a software to dissect the road network into 10' segments. This software then identifies deficiencies in the pavement surface and geolocates them on a GIS map for quick repair by staff. Crack sealing is an integral part of any asphalt management program and it is anticipated that the first cracks to be sealed by City staff will occur in the second quarter of FY21.

### **FY20 Sidewalk Work:**

Like the realignment of the street operations budget, the FY20 sidewalk budget was also enhanced last year to provide for a more robust sidewalk management program. The FY20 sidewalk budget was funded at \$701,266. However, COVID-19 and the resulting impacts from the pandemic affected this service as well. The following sidewalk work was planned and completed based on repair method:

- 11,123 LF of Sidewalk replacement planned; 3,448.18 LF at a contract cost of \$114,560.87 completed
- 64,021 ft<sup>2</sup> of sidewalk mud raising planned; 83,729 ft<sup>2</sup> completed at a contract cost of \$251,184
- 10,543 In-ft of sidewalk planned for slicing; 406.95 In-Ft completed at a contract cost of \$20,347.67



### **FY21 Programmed Sidewalk Work:**

The plan of the Streets & Drainage Team is to continue focusing on addressing the multiple backlogged work orders submitted community wide with priority based on the Sidewalk Repair Policy. The approach is intended to improve community safety, maximize resources and restore a level of customer service to residents that in many cases have not received sidewalk services for several years following their submission. \$525,019 was approved in the FY21 budget process for FY21. Coupled with the remaining funds from FY20, we have a total of \$821,000 programmed for FY21. As of December 2020, \$205,349 (33%) was invested back into the network. The estimated sidewalk work planned for FY21 and based on each repair type is listed below

- 25,855 LF of Sidewalk replaced at a contract cost of \$446,000
- 110,000 ft<sup>2</sup> of sidewalk mud raised at a contract cost of \$330,000
- 474 In-ft of sidewalk sliced at a contract cost of \$45,000

### **FY21 Programmed Street Work:**

In FY21 the Department will expand further the new sidewalk repair tracking tool, to include pothole tracking, drainage services, and other general division related tasks that can be enhanced by leveraging available technology and asset management. As well as further develop the joint seal and curb repair/replacement programs as previously identified for second and third quarter of 2021. \$1,000,000 was funded in the FY21 budget process for street reinvestment. With the remaining funds from FY20, we have a total of \$1,815,972 programmed for FY21. As of January, 2021, \$211,794 (12%) has been invested into the network. This total expenditure is omissive of any invoices that are currently being generated for interlocal paving operations underway along Harkey Road

Also planned for FY21 is the implementation of a new data collection tool from RoadBotics. This tool allows for City staff to conduct a road survey and determine the condition/PCI score inhouse by mounting a smart phone to the windshield of a vehicle and recording while driving the roadway. Video data captured by the phone's camera is analyzed and broken into 10' segments by RoadBotics. The condition of each segment is used to determine a score for the road surface, geo locate exact areas of potholes and other deficiencies. This data is then uploaded into the City's GIS system in a easy-to-use format to better communicate repair needs throughout the organization and improve efficacies when dispatching staff to needed repair sites. We are currently conducting a pilot program with RoadBotics before purchasing the tool. It is anticipated that RoadBotics will be implemented in conjunction with a forthcoming update to the pavement condition audit provided by the previous surveyor IMS. Additional information on that topic is outlined later in this memo. The following is a list of streets to be improved within FY21, in addition to those which were unable to be completed during FY20 due to COVID-19 and other service interruptions.

## I. FY 21 Streets to be Repaved

Street	To	From	PCI	Length	Width
Garden	City Limits	Broadway	69	11069	20
Veterans	Walnut	Mary's Creek	79	2030	20
Old Alvin	McHard Rd	Hickory Slough	64	2,463	20
S. Grand Blvd	Broadway	Walnut	55	658	36
S. Grand Blvd	Broadway	Walnut	58	699	73
E. Pear	S. Main	S. Galveston	50	1300	28
S. Park Ave	Broadway	Walnut	50	1140	24
Roy	City Limits	Broadway	54	9908	20
Max	City Limits	Broadway	49	7188	20

Total cost for streets listed above for full reclamation and overlay is **\$833,151.86**.

County Assisted and /or Contracted Overlay						
Street	To	From	PCI	Length	Width	Status
<b>O'Day Rd</b>	City Limits	Broadway		9806	20	FY21 interlocal agreement
<b>Veterans</b>	Walnut	Mary's Creek	79	2030	20	FY21 interlocal agreement
<b>Old Alvin</b>	McHard Rd	Hickory Slough	64	2,463	20	FY21 interlocal agreement

2.70 Miles

### **Fiscal Year 2021 Funding Streets Investment and Impacts:**

Presently, based on the ROW Assessment, the recommended annual funding to maintain the overall system PCI at a value of 72 is \$4.6 million for the street network, and \$1.7 million for the sidewalk network. The chart shows the relationship between funding the maintenance or losing ground on the pavement condition. With the ever-present reality of competing priorities for scarce funding, the following funding options and pavement conditions impacts are presented for consideration. The highlighted impacts are the amounts that we currently fund our street investments:

- \$4.6 million annually: Maintains the average network PCI at 72 over 5 years.
- \$3 million annually: Maintains the average network PCI at 70 over 5 years..
- \$2 million annually: Results in a 3 point average network PCI reduction to 69 over 5 years.
- \$1 million annually: Results in a 4 point average network PCI reduction to 68 over 5 years.

- \$450,000 annually: Results in a 4.5 point average network PCI reduction to 67.5 over 5 years.
- Do Nothing: Results in a 5 point average network PCI reduction to 67 over 5 years.

### **Funding Mechanism Recommendation**

It is imperative to fund street maintenance now, or it will snowball into exponentially higher costs down the road. Those higher costs mean less flexibility for the budget, and ultimately restrain the city's ability to provide other services as the money will be going to roads instead. Once a street degrades to a certain point, it requires reconstruction. Reconstruction is dramatically more expensive compared to regular maintenance and is paid for with capital project dollars. The council and public must be aware that not funding street maintenance now will not only restrain future service expansion, but also reduce flexibility in capital projects.

To that end, a multi-year strategy is needed to increase funding to the necessary levels. The current budget and three options are presented. The longer it takes to achieve full funding the more funding will be required as the system ages. These options are meant to be a starting point for elected officials and staff. The numbers used in the options below are illustrative and may need to be adjusted up or down depending on revenue trends and the need for additional staff and/or equipment to administer the (proposed) larger street and sidewalk maintenance operations. The longer it takes to achieve full funding the more funding will be required as the system ages – as reflected in the options below.

#### **Current Budget**

The FY21 adopted budget allocated \$1M for streets and \$525K for sidewalks.

#### **Option 1 – Quickly Establish Full Funding**

This option is designed to reach \$3M in annual budget for streets and \$1M for sidewalks within two budget cycles.

FY22 – Build the base budget around street funding, increasing it to \$2.5M and sidewalks to \$750K.

FY23 – Increase the budget to \$3M for streets and \$1M for sidewalks.

#### **Option 2 - Three Year Plan**

This option is designed to reach \$3.25M in annual budget for streets and \$1.1M for sidewalks within three budget cycles.

FY22 – Increase the budget for streets to \$1.75M and sidewalks to \$720K.

FY23 – Increase the budget to \$2.5M for streets and \$900K for sidewalks.

FY24 – Increase the budget to \$3.25M for streets and \$1.1M for sidewalks

#### **Option 3 - Immediately Double Streets, then Ramp for Four Years.**

This option is designed to provide an immediate boost to streets, but full funding takes longer. This option is designed to reach 3.5M in annual budget for streets and \$1.2M for sidewalks.

FY22 – Increase the budget for streets to \$2M and sidewalks to \$600K

FY23 – Increase the budget for streets to \$2.5M and sidewalks to \$700K

FY24 – Increase the budget for streets to \$3M and sidewalks to \$800K

FY25 – Increase the budget for streets to \$3.5M and sidewalks to \$1.2M

**Setting PCI Threshold:**

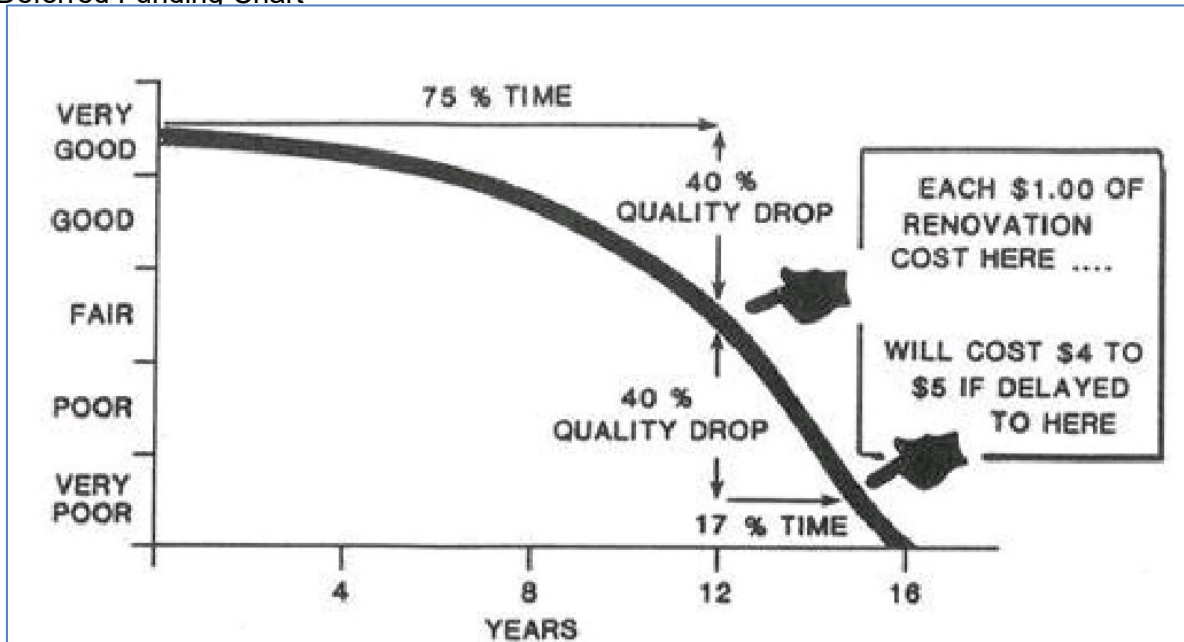
Although the City has utilized PCI for several years to communicate the overall network average and road specific conditions this assessment is only as good as the frequency in which a municipality partners with a third-party company to conduct a survey of its road network. How diligently the municipality manages that data after receiving it, adds to the shelf life and accuracy of the assessment. The assessment needs to be conducted regularly to ensure the accuracy of the data. Although the City’s average network PCI received a score of 72 during the last audit (2017), based on normal degradation and our level of reinvestment since 2017 it is estimated that the City’s current network average PCI is closer to 68.

In reviewing past white papers and discussion on PCI, it has come to our attention that the City of Pearland has only discussed PCI as a scoring criterion but never designated a PCI as a service level expectation, standard or threshold. As such we have yet to determine a target PCI to base funding and service provision assumptions upon.

Based on national standards and consultation with the pavement management company, who has conducted the previous two network audits, *it is the recommendation of the Public Works department to set its average network PCI score at 70.* Based on national data the average PCI goal for municipalities in the southern United States is 65, with road networks in the northern United States averaging a PCI of 60. The most impactful reasoning for the separation between the averages are the effects of snow and freeze-thaw cycles in the north which increase deterioration to pavement networks. Per the chart below, a score of 65 is defined as a “good” network with standard repair options necessary to maintain this standard. Further, determining a PCI allows staff to focus efforts and determine reoccurring budgets to systematically ensure the road network remains above this defined threshold. In order to maintain an average network PCI of 70, it is estimated that an annual budget of 2.9M will need to be provided annually for the next 5 years.

PCI Range	Description	Relative Remaining Life	Definition
85 – 100	Excellent	15 to 25 Years	Like new condition – little to no maintenance required when new; routine maintenance such as crack and joint sealing.
70 – 85	Very Good	12 to 20 Years	Routine maintenance such as patching and crack sealing with surface treatments such as seal coats or slurries.
60 – 70	Good	10 to 15 Years	Heavier surface treatments and thin overlays. Localized panel replacements.
40 – 60	Fair to Marginal	7 to 12 Years	Heavy surface-based inlays or overlays with localized repairs. Moderate to extensive panel replacements.
25 – 40	Poor	5 to 10 Years	Sections will require very thick overlays, surface replacement, base reconstruction, and possible subgrade stabilization.
0 – 25	Very Poor	0 to 5 Years	High percentage of full reconstruction.

Deferred Funding Chart



**Data Driven Approach to Pavement Management:**

As mentioned previously, a data driven approach to pavement management is only as good as the management of the data itself. As such it is the intent of the City to conduct a complete pavement audit in the FY22 budget process. Based on previous IMS surveys purchased by the City, it is anticipated that this service will cost an estimated \$300,000.00 but will allow a real-time view of our pavement infrastructure. It is the desire of the Public Works Department to set a standard to acquire a full pavement audit every five years to ensure this service is provided on a reoccurring basis that allows for regular confirmation of the average PCI threshold. In conjunction with this complete audit, it is planned that the City will acquire the pavement management software from RoadBotics and begin conducting annual inhouse audits to remain current on specific pavement management needs and locations. This initial cost for the assessment (data analysis) portion would be \$100,000, to conduct an inhouse audit through RoadBotics. Each subsequent year would require an annual licensing payment \$12,000 but provides the real time data needed to support asset management advancements and ensures application of resources and maintenance programs in location that will best maximize the life of the infrastructure.

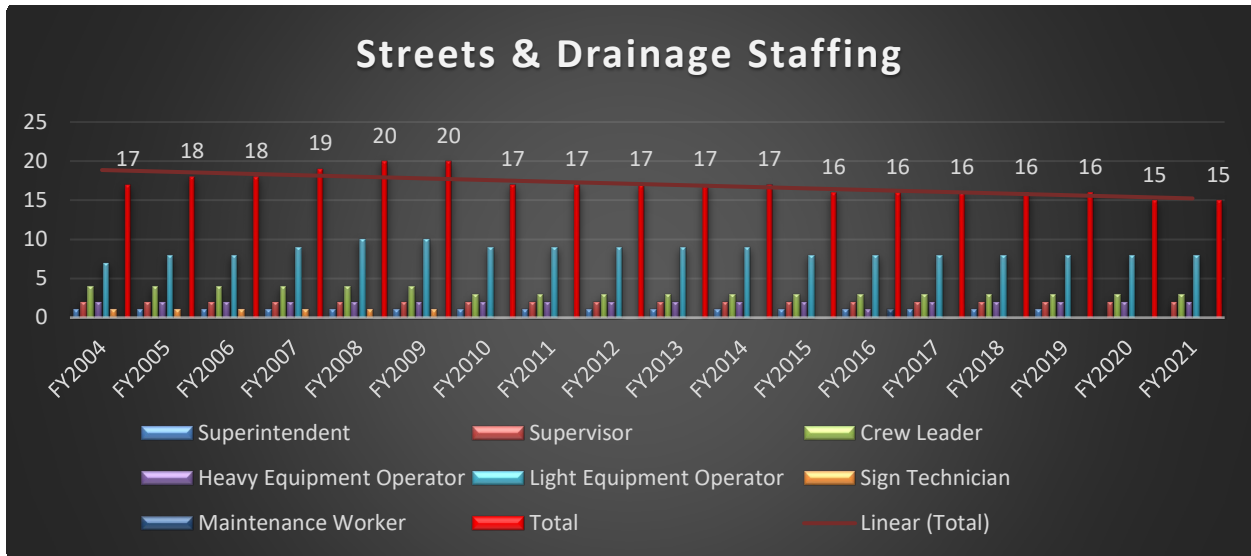
**Human Assets:**

It should be noted that streets and drainage service has not received an increase in staffing levels since 2009. In fact, division staffing has decrease by five positions between 2009 and 2020. A chart has been provided below to illustrate the staffing levels for the last 18 years. In comparison, the pavement network for both streets and sidewalk have realized a trend of steady growth during this same timeframe and resulted on more infrastructure being maintain by fewer and fewer team members. A chart indicating the growth of infrastructure in comparison to the decrease in staff has also been provided as a reference. Currently the City maintains 980 miles of streets and 650 miles of sidewalk, which is an increase of 58% and 56% respectively when compared to the 575 miles of street and 364 miles of sidewalk maintained in 2004

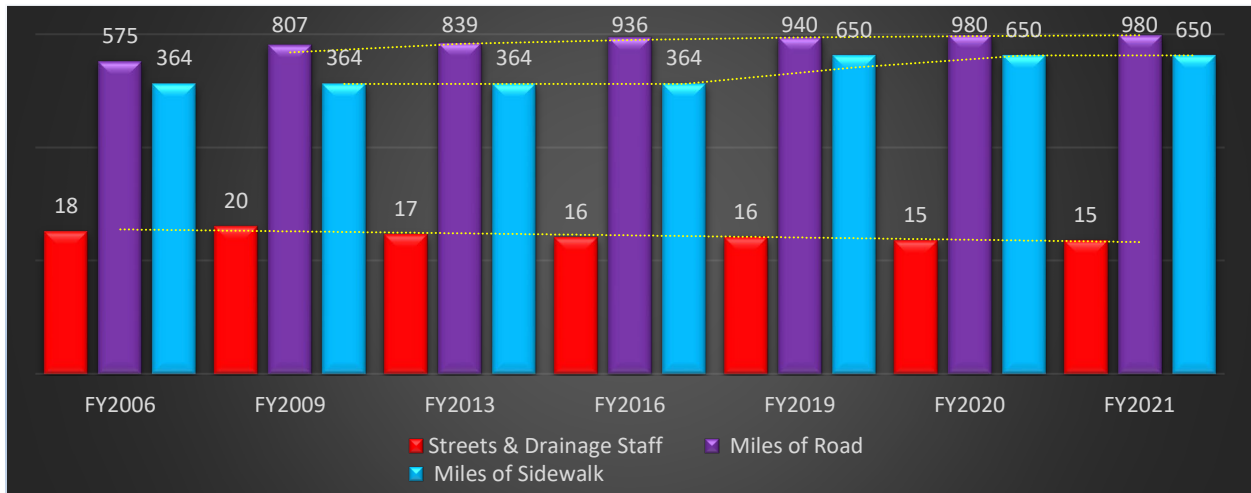
There has been much desire and discussion to fund the streets and sidewalk budgets to a point that will ensure the aging infrastructure is maintained and the City's average PCI is sustained. However, no matter how high the increase in operations & maintenance funds, the unfortunate reality is work will continue to be delayed or postponed until the human capital needed to exhaust these budget dollars and provide the necessary services is funded. It is anticipated that 6 maintenance workers, 1 heavy equipment operator, 2 crew leaders and 1 contract inspector will be requested in FY22 budget process. In order to optimize the staffing request and ensure only those necessary positions are added to the division, staff intend to create an entry level position (maintenance worker) and recommend funding at a lower pay grade than the current entry level position of an equipment operator. This will not only allow for the necessary labor positions but create additional advancement opportunities within the division and improve retention. The maintenance worker positions, equipment operator and crew leaders are intended to staff new services such as crack sealing, curb repair and hot shot teams for both streets and drainage needs. In most cases, reactive needs can only be met when scheduled projects such as interlocal paving, street repair or major ditching efforts have concluded since they require all current team members. The addition of hot shot services will allow for dedicated teams to address needs as requests are received and as resident safety dictate without the need to pull crews off of planned work. Further, the contract inspector positions are intended to support the transition of this division from relying heavily on in-house services to an outsourced services approach to many of the cost prohibitive services provided by the division.

One additional transition that is anticipated by FY22 is a subsequent reorganization of the in-house concrete crew currently residing within the Distribution & Collection Division. This service is currently funded through the enterprise fund and it is anticipated that funding source will remain the majority provider moving forward. The restructuring of this team among the remaining pavement management professionals will improve process management and further the initiative for a complete streets approach to right of way management. Although this team has historically focused on conducting sidewalk, driveway and concrete road repairs when impacted by utility work, the combining of this team along with its resources, inclusive of a concrete truck, within the Right of Way Division will ensure optimal utilization of department resources and improved service provision network wide. Transitioning this team will allow for increased in-house capacity and general service improvement by broadening the scope of their current focus to include not only utility related repairs but also, curbs, sidewalks and any other minor concrete repair within the right of way.

Funded Position Chart



Growth Trend Chart:



**Shift in Maintenance Method:**

It is the intent of the Right of Way Division to improve the level of services rendered to our pavement network. For years, the desire of the service providers has been to retain as many of the tasks in-house and grow overburdened with task management. It should be noted here that these fifteen team members not only provide all concrete & asphalt street repair, curb repair, pothole patching and sidewalk management but also all open ditch drainage maintenance, enclosed pipe drainage system maintenance, waterway obstruction removal, high water management and much more. Because of this varied list of services, it is the intention of the division to transition to a contract-based approach to service provision. The transition to contracted services has proven cost effective and tremendously beneficial for other services managed by the Right of Way Division. Most appropriately the contracting of grounds management.

While this division can provide all facets of street and drainage repair, its heaviest consumer of staff resources is traffic control and major road repair/replacement. As such, these are two key services that the division intends to focus on outsourcing in FY21 and throughout FY22. The most recent pilot project for this study was the completion of asphalt overlay on O'Day Road. Staff efforted to conduct this major road repair in house but due to limited staffing, inclement weather and repeated equipment failure, we were unable to complete the task. Upon transition of these services to the ROW Division, staff developed construction specifications, awarded a contract, oversaw the repair project and closed the task in a matter of weeks. Moving forward all major road rehabilitation not completed under the interlocal agreement with Brazoria County is anticipated to be outsourced. This will allow staff to focus on key maintenance programs such as pot hole patching, isolated base repairs and patching, drainage management, flood mitigation, curb repair, and much more.

### **Equipment Needs:**

As echoed throughout, this service has been plagued with equipment failures. The Division currently maintains the oldest equipment in the Public Works fleet with many pieces having a purchase date prior to 1999. Through the FY21 budget process, it is anticipated that the Fleet Division of Public Works will be acquiring several pieces of much needed equipment. Those units include the replacement of a Vac-truck, (2) Gradalls, Backhoe, and a mini dump truck. Once confirmation of this purchase is received, a subsequent list of additional and necessary equipment will be submitted in the FY22 budget process. Those items include an asphalt patch truck, small roller, Skid Steer, haul trailer, walk behind saw, push camera and (2) crew trucks to ensure this division is adequately equipped to provide the work it continues to be accountable for. It should be noted that this is all required equipment for routine maintenance services such as pothole patching, minor roadway repairs, culvert cleaning, ditch cleaning & maintenance, which the division will continue to provide as our primary work and not inclusive of equipment used for major road projects.



# FY22 White Paper



To: Clay Pearson, City Manager

From: Robert D. Upton, P.E., Director of Engineering and Projects

CC: Trent Epperson, Assistant City Manager  
Clarence Wittwer, Director of Public Works

Date: February 5, 2021

Re: Unserved Water and Wastewater Areas

## **BACKGROUND**

The City of Pearland has been growing rapidly, and, at least *geographically*, unevenly, over the last 30 years. The annexation process has allowed for our City to expand to the current City limits driven by the growth demand in the development areas of residential subdivisions and commercial areas that we now incorporate. The development of these areas and the annexation of the land around them has led to pocketed areas that leave specific limited areas without access to City water or wastewater service. During previous annexation efforts we have heard from residents in these areas that despite being in the City for many years, they do not have access to public water and wastewater service. As we approach build out over the next few decades, we need a strategic plan to ultimately extend utilities to all businesses and residents, where practical and feasible.

**There are five targeted areas located within City limits that do not have City utilities provided in the City rights-of-way (attached map).** Three are located more in the central part of the city and the other two are located along the southern city limits. The areas contain residential lots that are utilizing water well and on-site septic systems and land that is currently undeveloped with no utility services.

The City Engineering and Public Works Departments, over time, have received requests and comments by potential developers and residents as to when City utilities would be extended to these areas. Additionally, there have been several developers that have been interested in the large lots for residential development but again these areas do not have City utilities and would require the developer to install utilities off-site and connect to the City utilities that are not nearby. The absence of service capacity leads to costly off-site improvements that can make the development financially non-viable.

The goal for the City is to provide utility service availability to our all our residents and commercial developments. *One rational, efficient way that the City expands the utility system to **promote connectivity and redundancy is when street expansions or reconstructions are scheduled in the Capital Improvement Program (CIP).***

An example of coordination of road and utility type of work is the installation of water and wastewater trunk mains in the McHard road expansion from Cullen to Mykawa and the installation of a trunk sewer main in Hughes Ranch Road for future connection to McHard Road. The

installation of these trunk mains are to provide redundancy and future connectivity so that new roads are not cut up for utility installation because the need was not forecasted at that time. While expansion of utilities along road corridors readies areas for extensions by future developments and serves some new customers, it leaves out annexed areas that did not have utilities extended when they were annexed. Resulting in areas that have been within the City for many years with no plan to ever connect those areas to utilities.

### **Current Process**

Staff continues to get requests as to utility service availability in the five areas, however there are several constraints and *Staff is requesting direction on how to best proceed to be able to address these unserved areas while meeting the current ordinances.* A brief discussion on the current process is presented below.

#### Residential/Commercial Development

The current process for the residential/commercial development is that it is the developer's responsibility to extend utility services to their project. The City, per the Master Plan, will participate in oversizing of utilizes when the main lines are to be utilized to serve over future developments. The Engineering Design Criteria Manual and the Uniform Development Code (UDC) sets forth requirements for the installation and the provision for the development. For example, the UDC section 3.2.4.2 states that the water and wastewater utility lines are to be extended through the frontage of property and be prepared for extension by the subsequent development. Developments can address utility extensions and connections for the lots and through the use of multiple ways financing assistance, such as the use of Municipal Utility Districts as is the most popular method through the Houston region.

#### Single Lot

For the single lot that has a failing on-site water well or on-site wastewater system in the 5 identified areas there is no mechanism for these lots to be served by utilities. Should the lot owners express the desire for City services it will be their responsibility to extend off-site water and wastewater mains to their property at their cost burden. They will be required to comply with the same rules and requirements as development. For a single lot in this type of situation the City staff response is that they would need to extend utilities, this causes challenges.

#### Single Lot Challenges

For a single lot to get water and wastewater service can require an off-site extension from several hundred feet to several thousand feet. The cost of this work can be a range of \$70 to \$120 a liner foot for each of the main lines (not including design or site restoration). In addition, there are additional site-specific costs that will need to be addressed by the lot owner.

1. Water and wastewater impact fees (\$6,477)
2. Abandonment of the on-site facilities (\$10,000-\$15,000)
3. Re-plumb to connect to water and wastewater (\$8,000-\$15,000)
4. Permit Fees

An option for service to the single lot, is potentially when streets are reconstructed as curb and gutter, when it is more efficient to install utilities with the construction of the street rehabilitation. The option of installation of water and wastewater in the CIP is carefully reviewed and vetted to determine if there is truly a return on the investment, connections to the system would be done and if there are other extenuating circumstances that the installation makes sense to include in

the project. The inclusion of a project to the CIP can be several years out and does not address the current request.

Besides the costs associated with the installation of the utilities, there are also existing ordinances that provide additional unintended consequences to the properties that may not want the utilities. As stated in the Code of Ordinances Chapter 30, Article III – Sewers:

**Sec. 30-78. - Connection to sanitary sewer required.**

**The owners of all houses**, buildings or properties used for human occupancy, employment, recreation or any other purpose, situated within the city and abutting on any street, alley, or right-of-way in which there is now located, or may in the future be located, a public sanitary or combined sewer of the city, is hereby required, at his expense, to install suitable toilet facilities therein, and to connect such facilities therein and to **connect such facilities** directly with the proper public sewer in **accordance with the provisions of this article within thirty (30) days** after the date of the official notice to do so, provided that the public sewer is within one hundred (100) feet of the property line.

In addition to the costs for the main line, there are additional site-specific costs that will need to be expensed by the single lot owner as required under the current ordinances.

1. Water and wastewater impact fees (\$6,477)
2. Abandonment of the on-site facilities (\$10,000-\$15,000)
3. Re-plumb to connect to water and wastewater (\$8,000-\$15,000)
4. Permit Fees

As indicated in Chapter 30 of the City ordinance once the utilities are within 100 feet of the residence and they are notified, they are required to connect to the system within 30 days and incur all costs. The costs for these connections are extension of the public line to the property, the required impact fees, on-site plumbing work needed to connect to the City utilities and abandonment of the on-site septic. The permits and costs for the work would need to be obtained and completed within 30 days can be between \$24,000 to \$35,000 to meeting this requirement. **To meet the ordinance requirements once the City utility is near the property, while providing great value, is costly to a single-family residential lot.**

Additionally, as indicated in Chapter 23 – Plumbing and Gas, further solidifies the requirement for connection to water and wastewater utilities and adds that if the system is expanded or in need of repairs that are above 50% of the value connection is required. There is a conflict here where Chapter 23 is more restrictive in the distance requirement of 200 feet versus Chapter 30 at 100 feet from the utilities to the property line.

*602.2.1 Public Water Available.* Public water service is to be considered available to a property when a municipal water main is located within two hundred (200) feet of said property. At the time that public water main becomes available to a property served by a private water supply, a direct connection shall be made to the public water main, in compliance with this article and all applicable laws and regulations, within thirty (30) days after the date of the official notice to do so, and the private water system shall be discontinued. No construction, expansion, or repairs costing over fifty percent (50%) of new construction cost shall be allowed for any private water system if public sewer service is available. If a malfunction of a private water system necessitates remedial

action by the city in order to protect public health, the owner of such system shall be responsible for and shall reimburse the city the full cost of that remedial action.

*701.2.1 Public Sewer Available.* Public sewer service is to be considered available to a property when a municipal sewer or manhole is located within two hundred (200) feet of said property. At the time that public sewer service becomes available to a property served by a private sewage disposal system, a direct connection shall be made to the public sewer, in compliance with this article and all applicable laws and regulations, within thirty (30) days after the date of the official notice to do so, and all septic tanks, cesspools and similar private sewage disposal facilities shall be abandoned and filled with suitable material. No construction, expansion, or repairs costing over fifty percent (50%) of new construction cost shall be allowed for any private sewage disposal system if public sewer service is available. If a malfunction of a private sewage disposal system necessitates remedial action by the city in order to protect public health, the owner of such system shall be responsible for and shall reimburse the city the full cost of that remedial action.

An example of the City installing utilities is in the Wagon Wheel subdivision south of the John Hargrove Environmental Complex. The City installed utilities in this subdivision but did not require all to connect and have allowed connections to happen over the years. To date not all properties are fully connected to the City utilities.

### **POTENTIAL NEXT STEPS**

With City Council's input, Staff would review the City ordinance and provide recommendations to include connection to the water system to Chapter 30 and resolve the distance requirement between Chapter 23 and Chapter 30. Staff would recommend that if utilities are extended to the unserved areas that a time frame to connect would also be required such as a 2 year to 4-year time frame.

The City has developed two areas that have been assessed pro-rata fees for utility construction. The pro-rata fees are collected by the City during the permitting phase and reimburse the City for the infrastructure that was installed to serve the property.

Staff has identified the areas within the City that do not have utility service (attached map). The area that is between Cullen Parkway to Woody Road, north of the Hickory Slough has been the most requested area. This area would be the first priority of the 5 areas to provide water and wastewater service. To begin to address this need, the water and sewer trunk main in the new extend McHard project has been designed to the needed depths to serve the area north of Hickory Slough. This is only a portion of the area. The areas are identified by the following streets, number of properties and the length of the street.

#### **Water and wastewater**

Aldmo Ln/Lee Rd/Hughes Ranch Rd – Approx. 4,500 LF – Number of properties – 53  
Stone Road/Hughes Ranch – Approx. 6,200 LF – Number of properties - 78  
Max Road (McHard to Hickory Slough) – Approx. 5,700 LF – Number of properties – 37  
Roy Road (McHard to Hickory Slough) – Approx. 4,900 LF – Number of properties – 77

Estimating cost to just run the infrastructure for these streets, which includes the installation of the water and wastewater trunk mains, service lines to the property and street replacement is

estimated to be \$21,054,000 or \$85,935 per property. This cost does not include the on-site utility abandonment and connection.

#### Wastewater only

Cullen Parkway (McHard to Hughes Ranch Rd) – Approx. 4,000 LF – Number of properties – 16  
Garden Road (McHard to Hickory Slough) – Approx. 2,100 LF – Number of properties – 43  
O'day Road (McHard to Hickory Slough) – Approx. 1,400 LF – Number of properties – 39

Estimating cost to just run the infrastructure for these streets, which includes the installation of the wastewater trunk mains, service lines to the property and street replacement is estimated to be \$4,308,000 or \$43,900 per property. This cost does not include the on-site utility abandonment and connection.

#### **STAFF RECOMMENDATION**

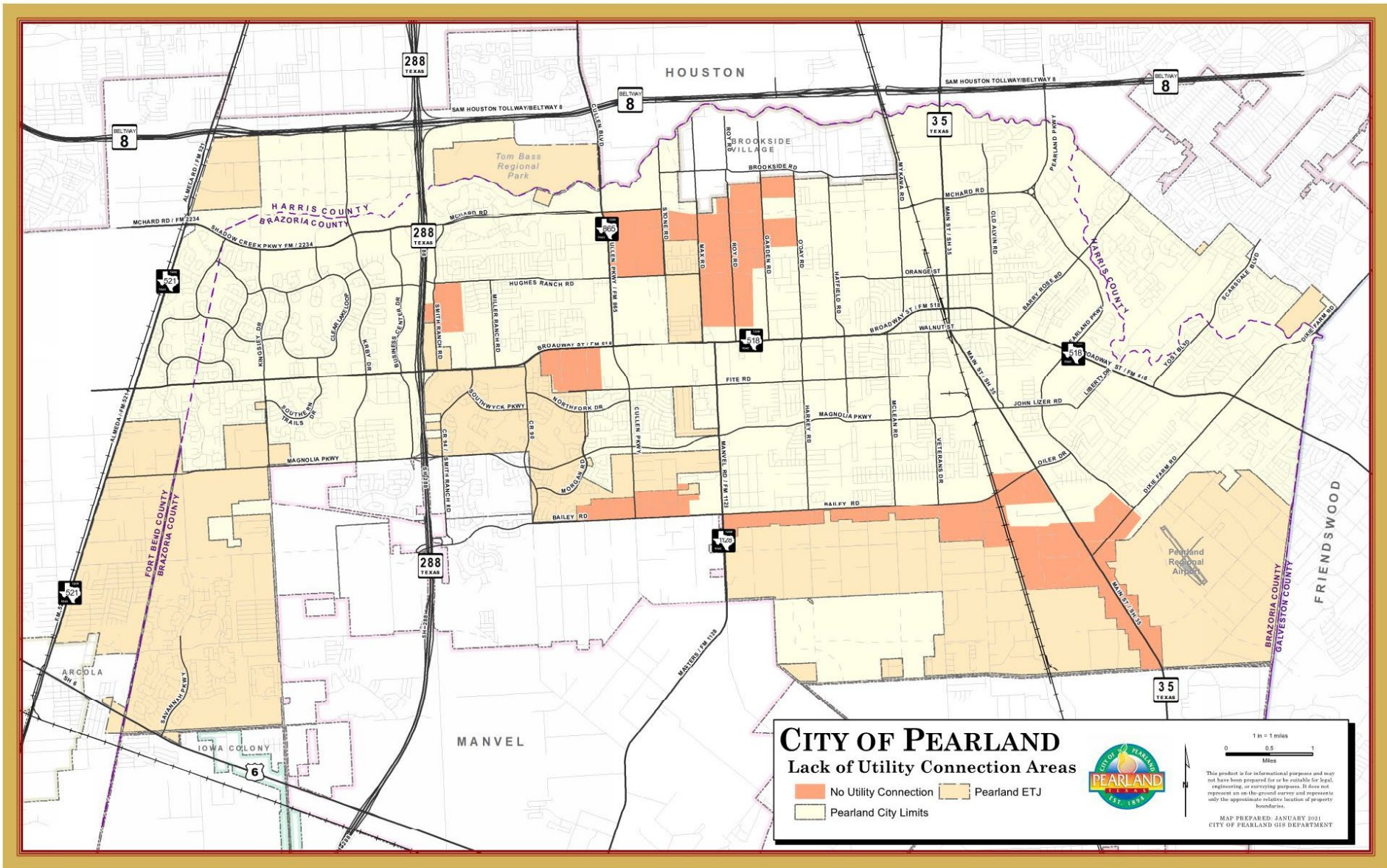
Due to the small quantity of lots over the entire area and the fact that this area is comprised of large single family lots is what is driving the high cost per lot to provide the utility infrastructure. **Staff's recommendation is to include utility infrastructure with proposed roadway rehabilitation as the roads are recommended through the CIP process.**

**Staff is recommending that the ordinances be evaluated and updated to remove conflicts and update Chapters 23 and 30 to include defined parameters of when properties are required to connect to City utilities.**

#### **COUNCIL DIRECTION**

Staff is requesting Council's concurrence to address the conflict in the ordinances associated with Chapters 23 and 30 and provide uniformity between them along with the UDC. This would be to unify the distance requirement to connect to city utilities, provide clarity on the requirement that if the 50% threshold is met connection to utility service is required and if utilities are provided the property owner is required to connect within a set time frame such as either 2 years or 4 years from the time that utilities are available.

Staff has researched our surrounding cities to determine their requirements. League City requires connection when the building versus property is within 300 feet of the wastewater line or when service becomes available. Missouri City, after 2015, does not allow private utilities to be installed without approval and if the property is within 400 feet and cost is less than \$10,000 to connect, the property is required to connect. Sugar Land requires that once the property is contiguous to the utility, the property has 180 days to connect.



# FY22 White Paper



To: Clay Pearson, City Manager  
From: Ron Burton, Surface Water Plant Manager  
CC: Trent Epperson, Assistant City Manager  
Clarence Wittwer, Director of Public Works  
David Van Riper, Assistant Director of Public Works  
Eric Hammond, Assistant Director of Public Works

Date: February 5, 2021

Re: Surface Water Treatment Plant Staffing FY22

## **Background:**

The Surface Water Treatment Plant is anticipated to begin service to the City in early January 2023. It is critical to have supervisory and technical staff prepared to assume the responsibilities of operations prior to its completion. In August 2019, Ron Burton joined the Public Works Department as the Surface Water Plant Manager to begin work with design engineers on operational aspects. Now in the construction phase, Ron continues working with engineers along with contractors on various details in areas of process and control.

A staffing plan for the plant has been included in the Public Works future staffing memos since 2018. Ron has refined and further developed the staffing plan with full job descriptions for each position, training manuals for operations and laboratory staff, a safety program, forms & reports for regulatory agencies, and is in the process of developing standard operating procedures for preventative maintenance and risk management. The next phase of the plan is hiring a Process Control Supervisor, Maintenance Coordinator, and Instrumentation & Control Technician in FY2022 for training with equipment suppliers and engineers.

## **FY2022 Employees Requested:**

Far in advance of startup, the Surface Water Plant will require a sequence of new staff to be hired to operate the facility. Plant operations will be performed in shifts on a 24/7/365 schedule. In FY2022, staff recommends the addition of a Process Control Supervisor, Maintenance Coordinator and Instrument and Control Technician to acquire plant specific knowledge of source water chemistry and the equipment that is being installed during the plant construction.

### **Process Control Supervisor**

The Process Control Supervisor will be responsible for the overall facility operations including but not limited to: working closely with the Maintenance Coordinator on projects, maintaining the integrity of membrane filters, and determining chemical dosages and flow adjustments.

### **Maintenance Coordinator**

The Maintenance Coordinator will be responsible for the overall facility maintenance, coordinating maintenance staff on projects, maintaining the asset management system, assigning work orders, managing the preventative maintenance program, and troubleshooting equipment for the Water Production and Wastewater divisions.

### **Instrument and Control Technician**

The Instrumentation & Control Technician will be responsible for ensuring functionality of all automated systems, specifically the supervisory control and data acquisition (SCADA) systems for the water treatment plant, water production, and wastewater facilities. This includes maintenance, repair, and upgrades of all hardware and software components and basic programming necessary to integrate changes.

All three positions will report to the SWP Manager and will be responsible for enforcing policies and guidelines to ensure compliance with regulatory agencies, coordinating treatment plant operations with the Water Production and Distribution divisions, and determining proper corrective procedures regarding water quality.

### **Additional Workforce for FY2023**

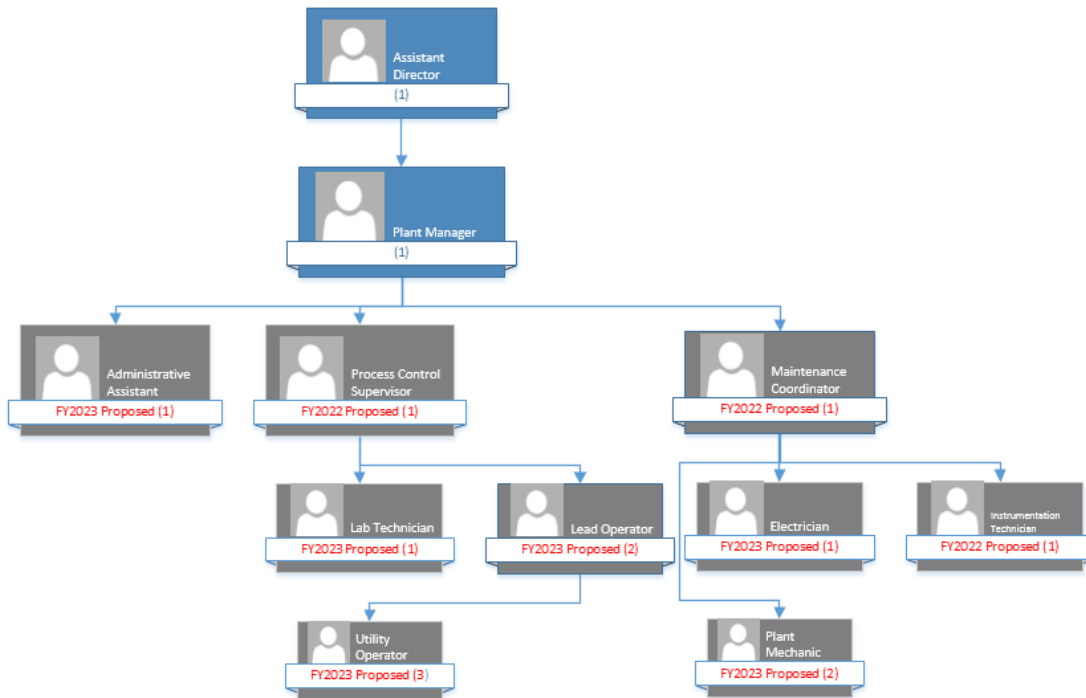
Budgeting and hiring additional personnel necessary for the full start up and operation of the plant is recommended in FY2023. This balance of plant staff includes the following recommended ten (10) positions: one (1) Electrical Technician, one (1) Laboratory Technician, two (2) Lead Operators, three (3) Utility Operators, two (2) Plant Mechanics, and one (1) Administrative Assistant.

In addition, the two (2) Plant Mechanics and Electrical Technician along with the Maintenance Coordinator and Instrumentation Technician will fulfill the completion of a much needed maintenance team. This team will also provide operational support in other city-wide water facilities (wastewater and water). The new surface water plant, future planned expansions of wastewater plants and our extensive network of lift stations, satisfy the need for these full-time positions. Furthermore, it is expected that these positions will provide a cost savings to the City by reducing outsourced services for mechanical and electrical maintenance, which we expend approximately \$200,000 annually.

Note: Reduction is expected in costs related to outsourced contracts utilized by Wastewater Treatment and Water Production divisions (STP contract, electrical contract, lab contract, etc.).

### **Surface Water Plant Organizational Chart:**





**Alternative Options**

Alternative options for staffing the Surface Water Plant, although not recommended, include contracting outsourced services for operations and maintenance or establishing a split in services between city staff and outsourced contractual services.

The overall drawbacks to these alternatives include: accountability, costs, and flexibility.

*Accountability:* The outsourced contractors that provide operational and maintenance services in the water and wastewater industry typically provide services on a smaller scale to Municipal Utility Districts. These contractors are profit motivated and even with adequate specifications and contract parameters, *tend to make decisions based on minimizing their costs without regard for the utility provider’s best interest.*

Operational Cost			
FY21	FY22	FY23	FY24
\$179,220	\$184,597	\$554,013	\$784,480

**Costs:**

We are capable to employ operators and maintenance personnel at industry rates, provide benefits, and assign necessary equipment needed at a lower cost than contracting out services. Outsourcing services is typically more advantageous to the City when it is seasonal, sporadic or requires an expertise that is not needed as full-time positions. We are unable to identify potential cost savings of contract operations at this time. Request have been made to potential service providers but none are willing to give an estimate without a final design.

*Flexibility:*

Currently, we outsource for almost all mechanical, electrical, and instrumentational work. Given the size of our water, wastewater and lift station systems, the additional staff will work across the enterprise fund to maintain assets at a lower costs.

*The cost of these alternatives will be further explored and compared to our staffing plan as part of the budget process.*

**Financial Impacts**

The financial impacts of the current staffing plan have been included in the Operation and Maintenance costs in the Rate Model for the past several years. This means that forecasted rate increases have taken these costs into consideration.