

# 2022

# Impact Fee Facilities Plan

Prepared for:

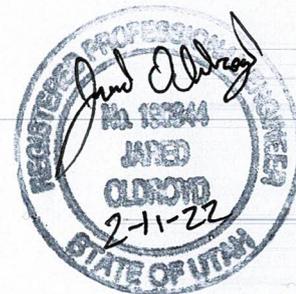


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## **INTRODUCTION**

This Impact Fee Facilities plan is based primarily on the Sandy Suburban Improvement District (SSID or District) 2021 Capital Facilities Plan. The District has completed several projects since the 2012 Impact Fee Facilities Study. The previous studies modeled flows in the system and showed deficiencies along certain lines. Field inspection of those areas have revealed that flows are not as high in the pipes as modeled in 2012. The District requested that their Engineering consultant, JWO Engineering, update the system model to reflect current conditions, model future flows in the system, and update the impact fee facilities plan. This Impact Fee Facilities Plan presents system features that are anticipated to be added, upgraded or replaced in order to serve anticipated development within the District boundaries.

## **SUMMARY FOR THE LAY PERSON**

The Impact Fee Facilities Plan identifies improvements that are needed in the Sandy Suburban Improvement District to serve growth and future development. There are a few areas in the District boundary that are anticipated to have new development occur and other areas may experience infill growth where older neighborhoods are replaced with new higher density development. The following projects are recommended to be completed in the next six years:

- Pioneer Avenue Relining – This project involves relining approximately 2568 feet of existing 12-inch concrete sewer line.
- 9800 S and Segoe Lily Relining – This project involves relining approximately 167 feet of 18-inch existing concrete sewer line.
- Manhole D005 Relining – This project involves relining approximately 537 feet of 8-inch existing concrete sewer line.
- Jordan Commons – This project involves the relining of approximately 424 feet of existing 8-inch concrete sewer line and the rehabilitation of 4 72-inch diameter manholes.
- 700 E Relining – This project involves the relining of approximately 2098 feet of 12-inch existing concrete sewer line.
- 500 W Area Relining – This project involves the relining of approximately 728 feet of 12-inch existing concrete sewer line and 526 feet of 8" existing concrete sewer line.

- High School Relining – This project involves the relining of approximately 2211 feet of existing 24-inch concrete sewer line near Jordan High School.
- Dimple Dell Area Relining – This project involves the relining of approximately 2211 feet of existing 10-inch concrete sewer line.
- 11400 S Relining – This project involves the relining of approximately 2448 feet of 12-inch existing concrete sewer line and 1400 feet of 18-inch existing concrete sewer line.
- 1700 E Relining – This project involves the relining of approximately 2501 feet of 12-inch existing concrete sewer line.
- State Street Relining – This project involves the relining of approximately 491 feet of 18-inch existing concrete sewer line.

The estimated cost of the Impact Fee Facilities Plan (IFFP) recommended improvements allocated to new growth is \$2,250,000.

## **BACKGROUND**

Sandy Suburban Improvement District serves approximately 50 percent of Sandy City, a portion of unincorporated Salt Lake County, and a small segment of Midvale City. The District owns and maintains approximately 150 miles of sewer lines that collect and transport wastewater to the South Valley Water Reclamation Facility (SVWRF) which treats the wastewater. SVWRF is located in West Jordan, Utah and discharges treated water into the Jordan River. SSID owns a 20 percent interest in the SVWRF. SSID's service area and pipe sizes are depicted in Figure 1 in the Appendix.

## **PLAN DEVELOPMENT**

The Impact Fee Facilities Plan (IFFP) is based on the 2021 Capital Facilities Plan, the 2012 Impact Fee Facilities Plan and information provided by the District. To meet State of Utah requirements for Impact Fee Facilities Plans, a required notice was posted by the District on the State public notice website. A copy of the notice is included in the Appendix. No public comments were received regarding the development of the plan.

## **Projected System Growth**

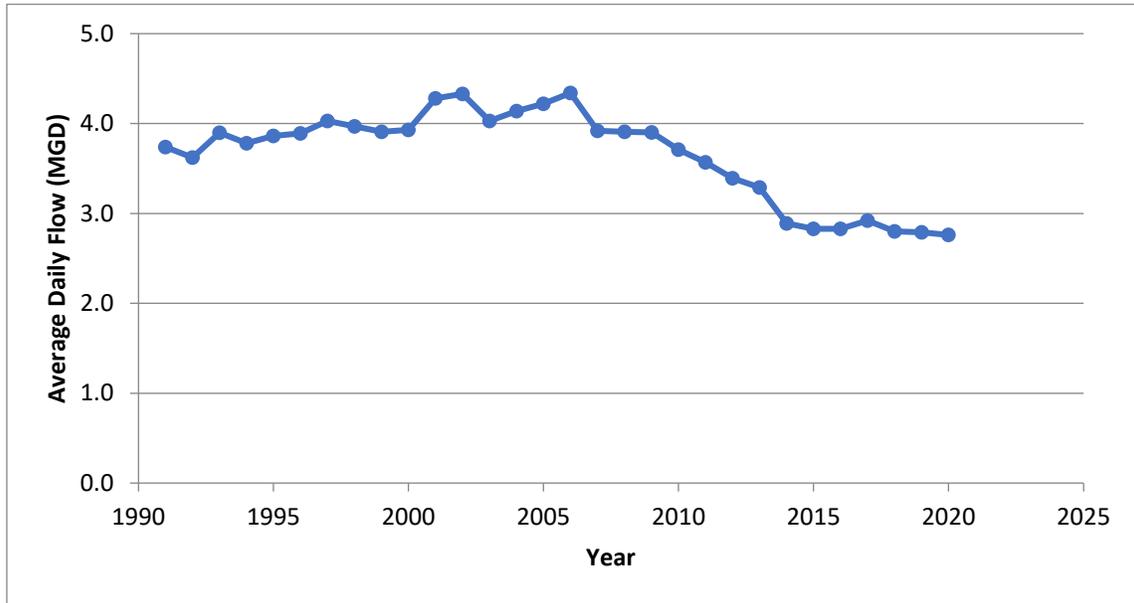
The Impact Fee Facilities Plan was developed based on development that will occur in the District boundary according to Sandy City plans including the Cairns Master plan for the downtown Sandy area. Salt Lake County Land Use plans were also reviewed in preparing this study. Copies of the Sandy City and Salt Lake County plans are available on their respective websites. The zoning maps were used to allocate additional wastewater loadings estimated from population growth in the service area.

Population estimates for Sandy Suburban Improvement District show a projected population increase of about 2200 people in the next five years. By comparing the additional population and the additional connections every year for the last ten years, the number of additional connections can be estimated. It is estimated that there will be an additional 60 connections per year added through the year 2027.

From the available zoning and development information, it appears that the residential areas of SSID have reached build-out. Infill development is occurring in residential neighborhoods like Historic Sandy near commercial centers. Major commercial redevelopment has been proposed for the area around Rio Tinto Stadium from 9000 South to 10000 South and State Street to Interstate 15. Much of this area slated for redevelopment is part of the Cairns District established by Sandy City. Residential units will also be a component of redevelopment in this area. There are also vacant parcels west of the Interstate near the SSID office that are zoned for Commercial and Industrial uses.

## **Treatment Capacity**

The District's share of the treatment capacity at SVWRF is adequate for the District's needs for the immediate and long-term future. Since implementing a Sewer and Water Insurance Plan (SWIP) program, SSID has seen a reduction in average daily flows. Rehabilitating District-owned pipes to prevent inflow and infiltration has also helped reduce the average daily flow in the District. In 2020, SSID's average daily flows were 2.76 MGD. Figure 1 shows the historical trend of average daily flows since 1991. It is estimated that flows will be around 3.0 MGD in 2025. This is far less than the District's share at SVWRF. Because flows are trending downward, it is expected that treatment plant capacity issues will not arise in the foreseeable future.



**Figure 1 – Historical Average Daily Flows**

### **Wastewater Collection System Model**

The wastewater collection system model was created using SSID’s ArcGIS database information, record drawings, and 0.5 m resolution bare earth Wasatch Front LiDAR Elevation Data. The model was completed and analyzed using Autodesk Storm and Sanitary Analysis. The system model includes all pipes in the District larger than 8 inches. Private laterals were not analyzed. The model was separated into three sections: the south area, the dimple dell area, and the north area. The model was run with an average day scenario flow and a peak day scenario flow. These flow numbers were obtained from SVWRF.

### **Flow Measurement / Model Calibration**

In order to have the model accurately reflect conditions in the system, the calculated flows were compared to measured flows and then the model was adjusted so that the flows match more closely. This process was repeated by adjusting the flow rates for various parts of the system until the model was considered a reasonable representation of the actual system. Increased accuracy of the model’s representation of the system can be obtained when measurements are made at multiple locations throughout the system. With the model accurately representing the

actual system, flows were increased in areas with anticipated growth and areas likely to experience infiltration. This models the impact new development and redevelopment will have on the level of service a sewer pipe can provide in its current state.

JWO Engineering recommends that flow monitoring be repeated at least every five years to track changes in flow rates from various parts of the system. Monitoring will also help identify infiltration rates.

## **LEVEL OF SERVICE**

The 2010 Capital Facilities Plan formalized the level of service that the District's collection system provides to the users. The amount of flow a sewer pipe can provide depends primarily on its size and slope. Slope is the amount of vertical drop there is in the pipe. If a pipe becomes more full, the risk of a backup increases. The level of service for pipes in the District is therefore separated into four categories as follows:

- Level of service A – Means the pipe can carry the peak flow and be 1/2 (50%) full or less.
- Level of service B – Means the pipe can carry the peak flow and be 2/3 (67%) full or less.
- Level of service C – Means the pipe can carry the peak flow and be at peak capacity (95%) full or less.
- Level of service D – Means that the pipe is above its peak capacity for gravity flow (surcharge condition).

The District's standard is to have new pipes designed for a level of service condition A at system build-out. Pipes that are identified in the modeling to have a level of service C or D are scheduled to be evaluated in the field to verify the model data set and develop pre-design data so that improvements can be planned.

## **EQUIVALENT RESIDENTIAL UNIT**

The level of service is also related to the Equivalent Residential Unit or ERU. The design flowrate from one dwelling is an ERU. The ERU in SSID has a history of decreasing over time as collection

lines are rehabilitated, technology improves low-flow fixtures, and households decrease in size. The equivalent residential unit definition has decreased over successive plans, the 2007 Master Plan, the 2010 Capital Facilities Plan, and the 2012 Impact Fee Facilities Plan. Based on the most recent flow information, the wastewater generated per account continued to decline.

The ERU definition recommended in this Impact Fee Facilities Plan is 6,750 gallons per month or 225 gallons per day. The 225 gallons per day is based on sewer flow records and includes infiltration and inflow. This definition aligns more closely with flow monitoring and account data. A comparison of the ERU definition across previous plans and this impact fee facilities plan can be found in Table 1.

**Table 1: Comparison of ERU definition by Year**

	<b>Gallons per Month</b>	<b>Gallons per Day</b>
<b>2007 Master Plan</b>	12,000	400
<b>2010 Capital Facilities Plan</b>	10,500	350
<b>2012 IFFP</b>	9,000	300
<b>2022 IFFP</b>	6,750	225

**MODEL RESULTS**

The model results for the scenario that represents 2021 average and peak flow conditions are found in the Appendix. The current level of service is indicated by the color of the sewer line. The Level of Service was determined for each pipe modeled larger than 8 inches in the system. Pipes over 1/2 full are considered full and need to be reevaluated as development occurs to verify their ability to serve present and future needs while keeping in mind that the unused pipe area serves as a safety factor to accommodate any sediment buildup, infiltration, and peak instantaneous flows that may be above the typical peak flow. Pipes over 2/3 full are considered over capacity and should be high priority projects. No pipes were over 2/3 full in either scenario and no pipe had a level of service C in either scenario. A 6” line is considered having a failing

level of service in these scenarios as 6" is smaller than the minimum recommended size in the district.

In the average day scenario, only one section of pipe reached Level of Service B. This section was a 27-inch section of pipe close to the high school. In the peak day scenario of 5.5 MGD, there were several lines in the Dimple Dell region that reached level of service B. This is a section of pipe that could be considered for relining.

Because the District has experienced reduced flows in the last decade, it is unlikely that the system is experiencing new capacity issues. However, peak times may still reach upwards of 5 to 6 MGD and could cause lingering capacity issues that should be monitored.

### **Demands by New Development Activity**

Future peak flow conditions were obtained by adjusting the model to include expected future growth. District flows are anticipated to increase by 0.35 mgd by 2030. Based on land use and planning information obtained from local municipalities and using growth projections from the Utah Governor's Office of Management and Budget, the model flows were increased District wide with specific flows added at certain points where large commercial or dense residential development are anticipated. The model was then run again with these projected flows to assess the short-term level of service capabilities of the system.

The results for the future peak flow scenario are found in Figure 3 in the appendix. The results of the future peak flow scenario were compared with the current peak flow scenario to identify areas where impacts based on growth or new developments are anticipated to occur. These pipe areas were analyzed and if the impact was significant, they were added to the impact fee facilities project list. The projects will be included in field evaluations and addressed according to the implementation schedule that will be decided by the District.

The model results show that the District's system, with minor exceptions, will provide a suitable level of service for existing users and anticipated build-out development activity.

Some project scope could be verified with up-to-date modeling when detailed development information is available. The District should prioritize finishing relining projects that have the greatest impact on the system first.

## IMPROVEMENT COST ESTIMATES

Estimates are included in the Appendix for all the Impact Fee Facilities Plan projects and summarized in Table 2 below.

**Table 2: Improvement Cost Estimates Summary**

<b>Description</b>	<b>Estimated Cost</b>	<b>% Attributable to new users</b>	<b>Estimated Cost attributable to new users</b>
Manhole M061 Rehab	\$46,000	40	\$18,400
6-inch upsized – Historic District	\$540,000	80	\$432,000
6-inch upsized – North District	\$492,000	80	\$390,000
Floyd Drive Upsize	\$110,000	80	\$90,000
Trax Crossing Upsize	\$190,000	80	\$150,000
Hyatt House and Granite Drive Manhole Additions	\$80,000	50	\$40,000
Pioneer Avenue Reline	\$270,000	50	\$135,000
9800 S and Seago Reline	\$100,000	50	\$50,000

Benson and State Reline	\$60,000	50	\$30,000
Jordan Commons Rehab	\$100,000	50	\$50,000
700 E Reline	\$210,000	50	\$105,000
500 W Area Reline	\$220,000	50	\$110,000
High School Reline	\$450,000	30	\$135,000
Dimple Dell Area Reline	\$200,000	50	\$100,000
11400 S Reline	\$400,000	50	\$200,000
1700 E Reline	\$270,000	50	\$135,000
State Street Reline	\$160,000	50	\$80,000
<b>TOTAL</b>			2,250,000

**Improvement Cost Distribution** – All relining projects can be 50% attributable to new growth in the system. The non-relining projects vary from 30% to 80% attributable to new growth in the system. The upsizing projects are 80% attributable to new growth in the system.

Because the current users have already paid to develop the available capacity and additional flows will cause the lines to reach a lower level of service, new development will be responsible for the costs of improvements to the system required to maintain the current level of service after their flow is added to the system.

## **CAPITAL PROJECT IMPLEMENTATION SCHEDULE**

The recommended improvements were grouped into relining projects and non-relining projects to give the District a way to identify the relative importance of completing improvements. Additional factors that may affect the timing of a project include:

## **Pipe Condition**

Pipe condition has been a critical factor in determining capital project implementation schedule. There do not appear to be areas where rapid deterioration is occurring. If inspection activities identify rapidly deteriorating pipe then the schedule for implementing corrective action should also be accelerated.

## **Schedule of Related Improvements**

If the City or other agency is completing a project in the vicinity it may be beneficial to complete the SSID project at the same time to minimize disruptions to traffic and residents. If paving projects are completed by others, moratoria may be placed that would restrict the ability of the District to complete piping projects in that street for several years.

## **CONCLUSION**

The Sandy Suburban Improvement District sewer system appears to be substantially designed to handle the current flows and anticipated build-out of residential and commercial development within the District boundaries. Modeling indicates that most capacity issues have been minimized because of the overall decrease in the flow the district is receiving.

It is recommended that development be monitored to verify that the development that occurs is within the capacity anticipated. If a new large industrial water user were to locate within the District, the ability to serve that industry would have to be evaluated and adjustments made to this plan to account for the changes.

The District should reexamine and update the Impact Fee Facilities Plan in the year 2027 unless major development activity takes place which would warrant an earlier update to this plan.

## **APPENDIX**

Figure 1 Sandy Suburban Improvement District

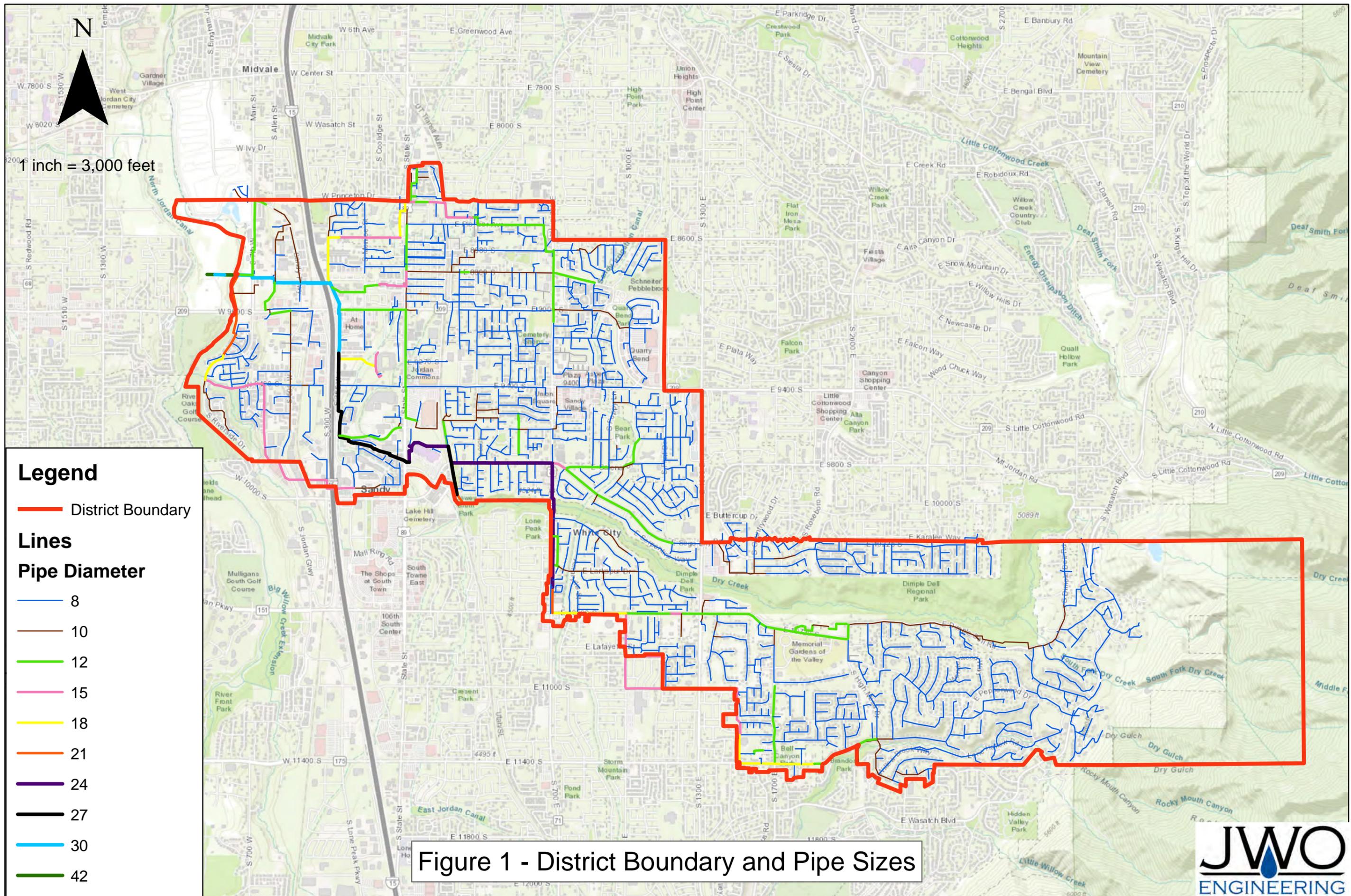
Figure 2 Level of Service – Peak Day

Figure 3 Level of Service – Average Day

Figure 4 2022 Impact Fee Facilities Project Locations

Project Cost Estimates

Notice of Intent to Prepare or Amend Impact Fee Facilities Plan



N

1 inch = 3,000 feet

**Legend**

— District Boundary

**Lines**

**Pipe Diameter**

- 8
- 10
- 12
- 15
- 18
- 21
- 24
- 27
- 30
- 42

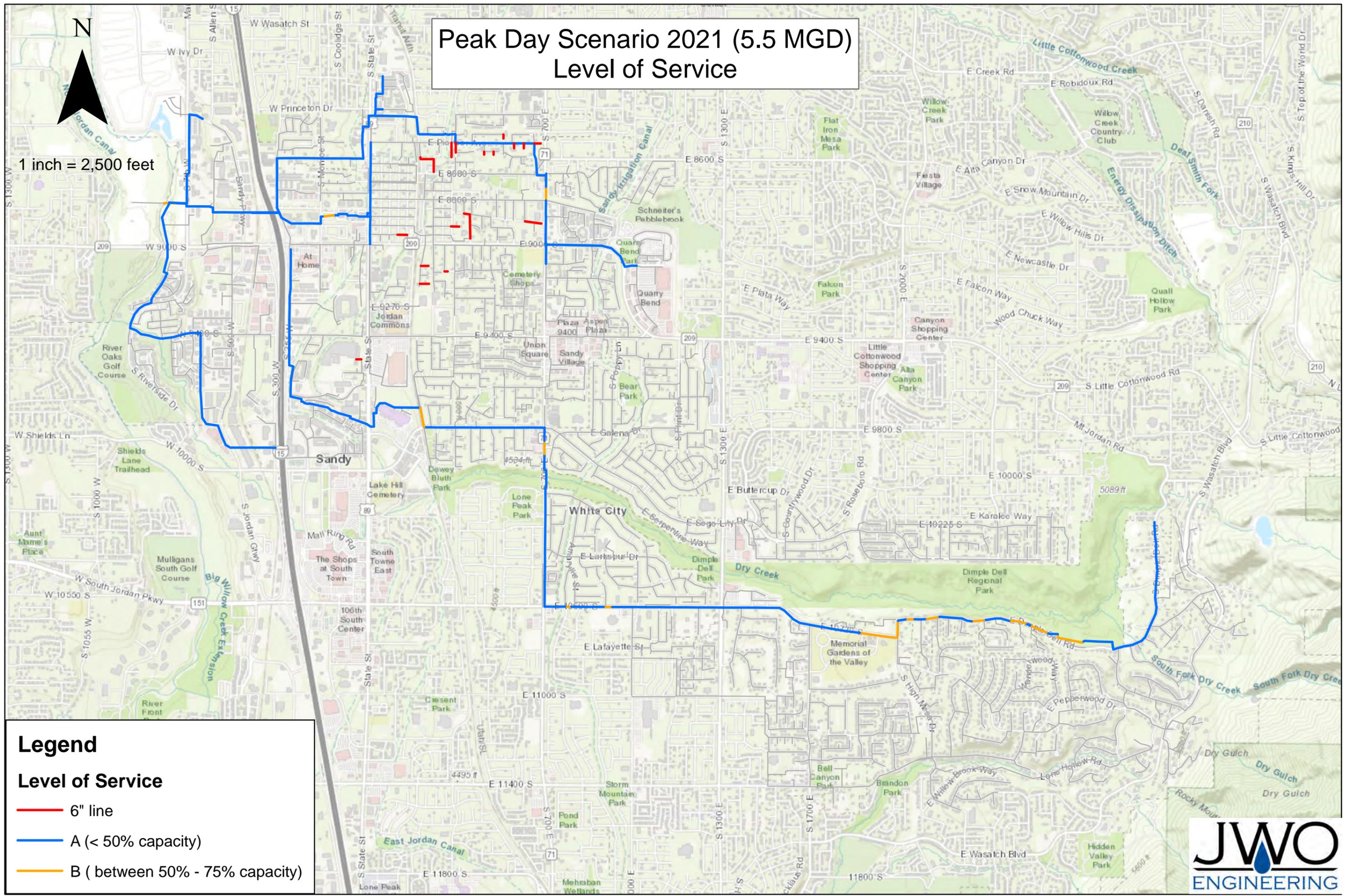
Figure 1 - District Boundary and Pipe Sizes

# Peak Day Scenario 2021 (5.5 MGD) Level of Service



1 inch = 2,500 feet

- Legend**
- Level of Service**
- 6" line
  - A (< 50% capacity)
  - B (between 50% - 75% capacity)

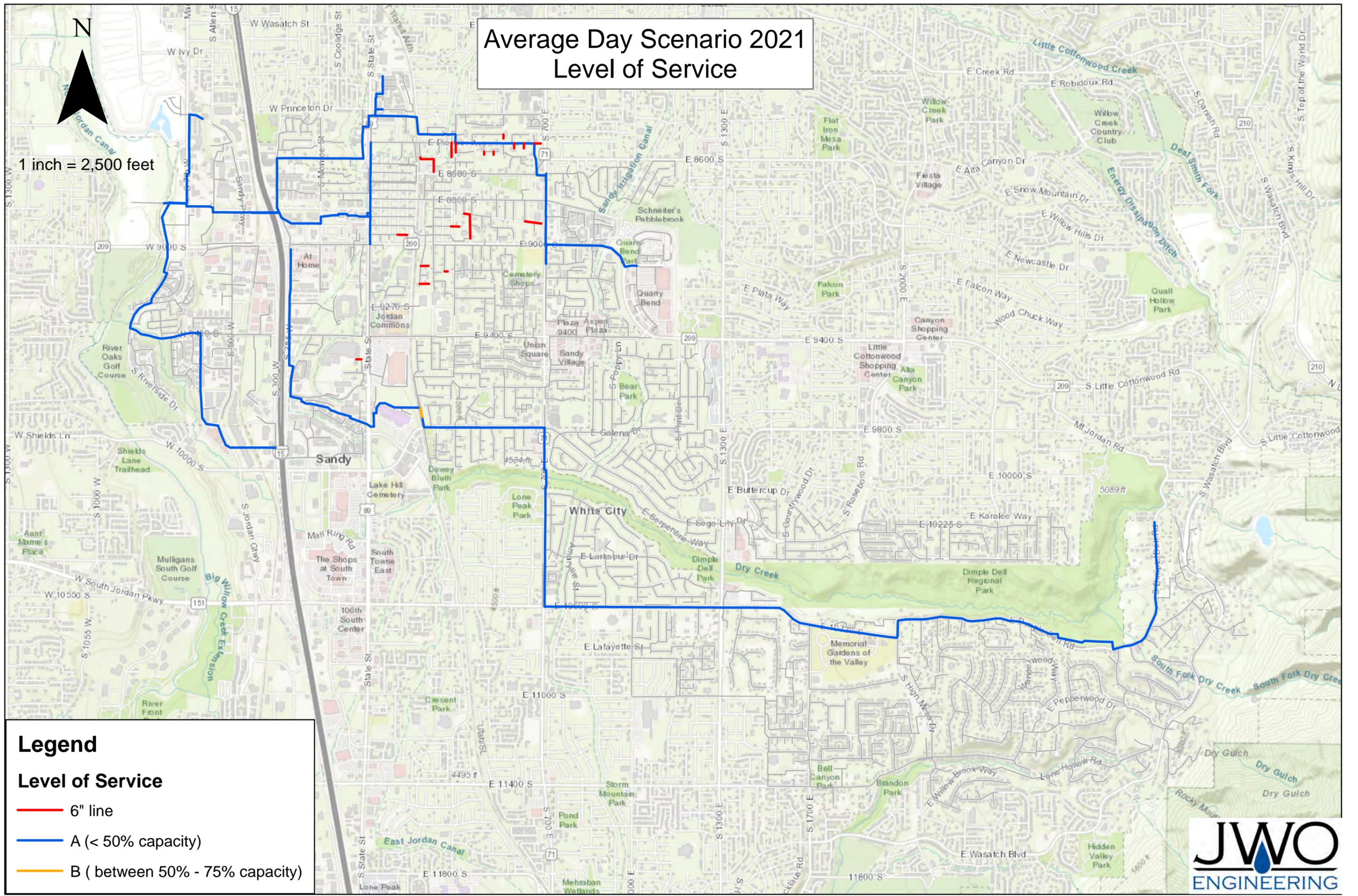


# Average Day Scenario 2021 Level of Service



1 inch = 2,500 feet

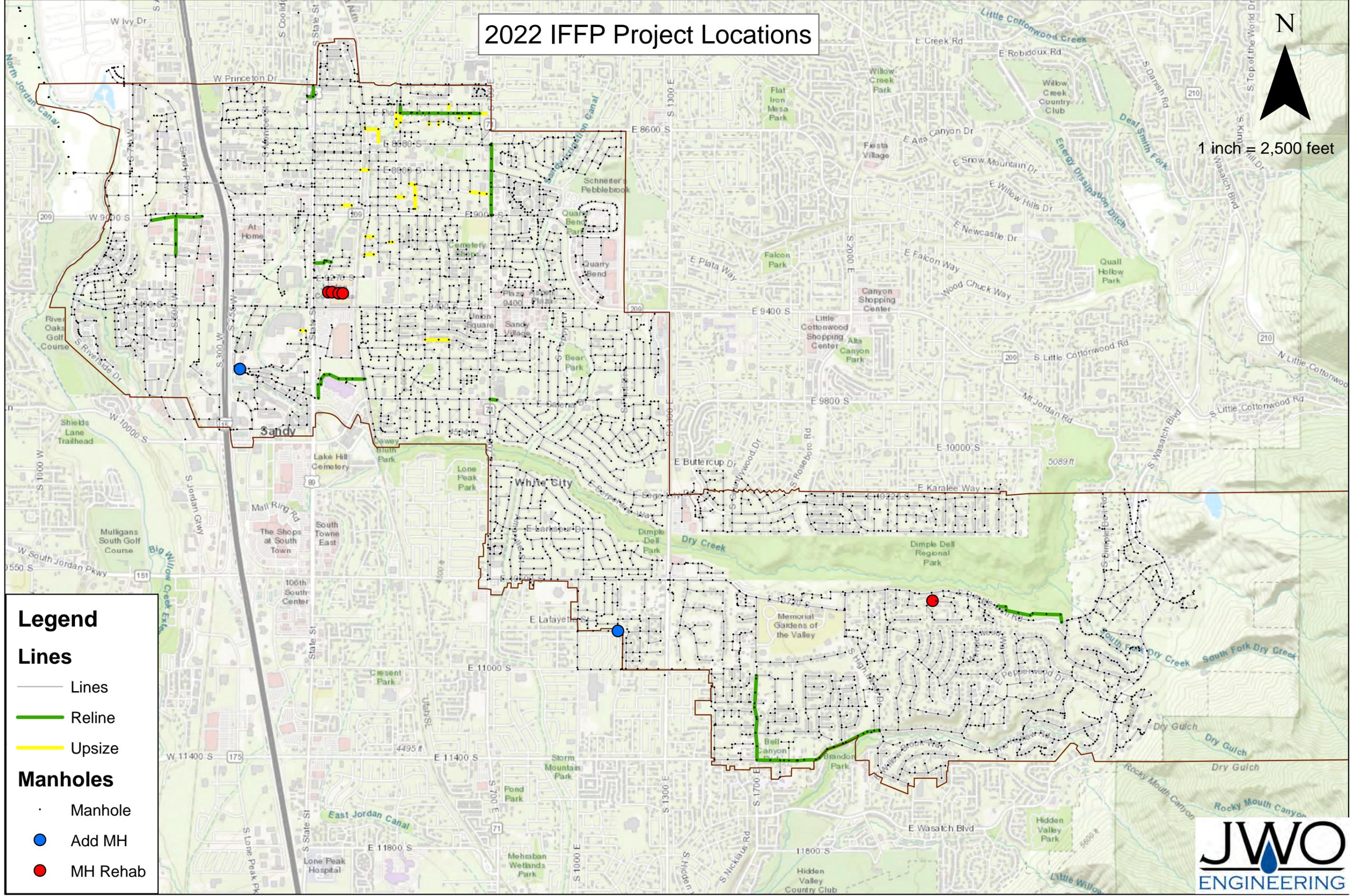
- Legend**
- Level of Service**
- 6" line
  - A (< 50% capacity)
  - B (between 50% - 75% capacity)



# 2022 IFFP Project Locations



1 inch = 2,500 feet



## Legend

### Lines

- Lines
- Reline
- Upsize

### Manholes

- Manhole
- Add MH
- MH Rehab



SSID 2021 Capital Facilities Plan Projects

NON RELINING PROJECTS								
Project	Description	Size	Type	Criticality	Priority	Estimated Cost	% impact	Total impact fee
Edenbrook Backyard	Backyard Sewer to remove laterals from failing line		Rehab	C	B	\$ 200,000.00	0 \$	-
Londonderry Backyard	Locate manhole and rehabilitate		MH Rehab	D	D	\$ 40,000.00	0 \$	-
MH 61 Rehab	Rehabilitate drop manhole not in road		MH Rehab	D	C	\$ 46,000.00	40 \$	18,400.00
6" Upsize	Historic District	8"	Upsize	C	B	\$ 540,000.00	80 \$	432,000.00
6" Upsize	North Area	8"	Upsize	C	B	\$ 492,000.00	80 \$	390,000.00
Floyd Dr Upsize	8" to 10" upsize		Upsize	C	B	\$ 110,000.00	80 \$	90,000.00
Trax Crossing Pipes	8800 S upsize		Upsize	B	C	\$ 190,000.00	80 \$	150,000.00
Add ManholeS	Trunkline @Hyatt House & Granite Dr		Add MHs	C	B	\$ 80,000.00	50 \$	40,000.00
RELINING PROJECTS								
Project	Description	Size	Type	Criticality	Priority	Estimated Cost	% impact	Total impact fee
Pioneer Ave	Section on 300 E then 300 E to Lynwood on Pioneer	12"	Rehab / Cipp	A	A	\$ 270,000.00	50 \$	135,000.00
9800 S and Sego	Rehabilitate line not already lined last time	18"	CIPP	B	B	\$ 100,000.00	50 \$	50,000.00
Benson and State	D005 Reline between houses D003 to D007	8"	CIPP	D	C	\$ 60,000.00	50 \$	30,000.00
Jordon Commons	Manholes and lines Relining	var	CIPP/Rehab	C	B	\$ 100,000.00	50 \$	50,000.00
7th E	7th North of 90th S	12"	CIPP	C	B	\$ 210,000.00	50 \$	105,000.00
5th W Area	600 W tie in to 90th Concrete and flat	12"	CIPP	C	C	\$ 220,000.00	50 \$	110,000.00
High School	Line areas not already lined	24"	CIPP	A	A	\$ 450,000.00	30 \$	135,000.00
Dimple Dell	Whole section out of road	10"	CIPP	C	B	\$ 200,000.00	50 \$	100,000.00
114th S	Above 17th E to 23rd E	12"-18"	CIPP	B	B	\$ 400,000.00	50 \$	200,000.00
1700 E	114th S to Susan	12"	CIPP	C	B	\$ 270,000.00	50 \$	135,000.00
State Street	Section N of Mars	18"	CIPP	B	B	\$ 160,000.00	50 \$	80,000.00
TOTAL						\$ 4,138,000.00	IMPACT FEE TOTAL	\$ 2,250,400.00



## **NOTICE OF INTENT TO PREPARE AN IMPACT FEE FACILITIES PLAN**

Pursuant to UTAH CODE ANN. §11-36a-501, notice is hereby given that Sandy Suburban Improvement District, a political subdivision of Salt Lake County, State of Utah, intends to prepare an impact fee facilities plan (“IFFP”) related to public sanitary sewer collection and transportation services. It is proposed that impact fee facilities be located at the sites indicated on the geographical map attached hereto. The public is hereby invited to provide information for the District to consider in the process of preparing, adopting, and implementing the impact fee facilities plan.