Capital Improvements Plan (CIP)
Water Delivery / System Development

Capital Improvements Advisory Committee
September 5, 2018

carollo
Engineers...Working Wonders With Water®

Impact Fee Calculation

Today's focus

$$Calculated\ Impact\ Fee = \frac{Cost\ of\ Eligible\ CIP}{Added\ EDUs}$$

- LUAP provides number of added EDUs
- CIP provides cost of eligible capital improvements
  - Extensions and expansions
  - Pipeline upsizing
- Study period for LUAP and CIP is 10 years
  - How many EDUs are expected to be added in 10-year study period?
  - What is the cost of the capacity that is required to serve these added EDUs?

Impact Fee Components

Water Supply

Water Delivery
System Development

Water Delivery
Flow

Wastewater
Collection

Wastewater
Treatment

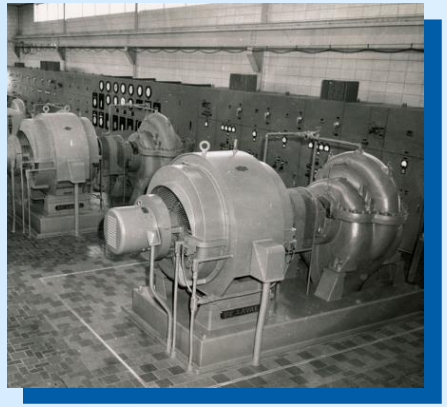
Water Delivery / System Development Components

Well Pumps

Elevated
Storage Tanks

Transmission
Mains

Ground Storage Tanks



High Service and
Booster Pump Stations

Water Delivery / System Development Value – Well Pumps

Existing value of well pumps is **$123,454,536**

- Valuation method is Original Cost (OC)
- Value is not depreciated
- Value excludes contributed assets

Value of well pumps CIP projects is **$17,060,000**

- Value is in 2018 dollars
- Value does not include financing costs

Allocation of Water Delivery / System Development / Well Pumps Value to Impact Fee

Allocation is based on maximum day demand (MDD)

- 2018 population is 1,851,348; 2028 population is 2,190,178
- $Average\ Day\ Demand\ (ADD) = \frac{290\ gpd\ per\ EDU}{2.39\ persons\ per\ EDU}$
- $ADD = 121\ gallons\ per\ capita\ per\ day\ (gpcd)$
- Maximum day peaking factor (MDPF) is 1.78 (*Water Infrastructure Plan*)
- $MDD = ADD * MDPF * Population$
- $2018\ MDD = 121\ gpcd * 1.78 * 1{,}851{,}348 = \mathbf{398.7\ mgd}$
- $2028\ MDD = 121\ gpcd * 1.78 * 2{,}190{,}178 = \mathbf{471.7\ mgd}$
- $Study\ Period\ Demand = 2028\ MDD - 2018\ MDD$
- $Study\ Period\ Demand = 471.7\ mgd - 398.7\ mgd = \mathbf{73.0\ mgd}$

Allocation of Water Delivery / System Development / Well Pumps Value to Impact Fee

Total available capacity is 171.9 mgd

- $2018\ Capacity = 533.6\ mgd$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ MDD$
- $Existing\ Available\ Capacity = 533.6\ mgd - 398.7\ mgd = 134.9\ mgd$
- $Future\ CIP\ Capacity = 37.0\ mgd$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 134.9\ mgd + 37.0\ mgd = \mathbf{171.9\ mgd}$

Impact fee eligible allocation is 42.5%

- $Allocation = \frac{Study\ Period\ Demand}{Total\ Available\ Capacity}$
- $Allocation = \frac{73.0\ mgd}{171.9\ mgd} = \mathbf{42.5\%}$

Water Delivery / System Development Components

Well Pumps

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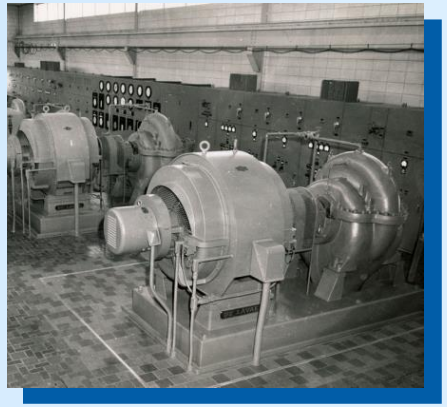
Ground Storage Tanks



High Service and
Booster Pump Stations

Water Delivery / System Development Value – Elevated Storage Tanks

Existing value of elevated storage tanks is $72,527,322

- Valuation method is Original Cost (OC)
- Value is not depreciated
- Value excludes contributed assets

Value of elevated storage tanks CIP projects is $41,381,885

- Value is in 2018 dollars
- Value does not include financing costs

Allocation of Water Delivery / System Development / Elevated Storage Tanks Value to Impact Fee

Allocation is based on TCEQ requirements

- TCEQ requires minimum 100 gallons per connection of EST capacity, but WIP may recommend a higher minimum for each service area
- $1\ connection = 1.64\ EDUs$
- $EST\ Capacity\ Requirement = Minimum\ gal/conn * \frac{No.\ EDUs}{1.64}$
- $Study\ Period\ Requirement =$
  $2028\ EST\ Capacity\ Requirement -$
  $2018\ EST\ Capacity\ Requirement$

Allocation of Water Delivery / System Development / Elevated Storage Tanks Value to Impact Fee

High Service Area Study Period Requirement

- $2018\ EST\ Capacity\ Requirement = 219\ \frac{gal}{conn} * \frac{23{,}755\ EDU}{1.64} =$ $\mathbf{3.2\ MG}$
- $2028\ EST\ Capacity\ Requirement = 219\ \frac{gal}{conn} * \frac{30{,}600\ EDU}{1.64} =$ $\mathbf{4.1\ MG}$
- $Study\ Period\ Requirement = 4.09\ MG - 3.17\ MG = \mathbf{0.9\ MG}$

Allocation of Water Delivery / System Development / Elevated Storage Tanks Value to Impact Fee

Total available capacity for High Service Area is 7.2 MG

- $2018\ Capacity = 5.4\ MG$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ EST\ Capacity\ Requirement$
- $Existing\ Available\ Capacity = 5.4\ MG - 3.2\ MG = 2.2\ MG$
- $Future\ CIP\ Capacity = 5.0\ MG$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 2.2\ MG + 5.0\ MG = \mathbf{7.2\ MG}$

Impact fee eligible allocation for High Service Area is 12.7%

- $Allocation = \frac{Study\ Period\ Requirement}{Total\ Available\ Capacity}$
- $Allocation = \frac{0.9\ MG}{7.2\ MG} = \mathbf{12.7\%}$

Allocation of Water Delivery / System Development / Elevated Storage Tanks Value to Impact Fee

Middle Service Area Study Period Requirement

- $2018\ EST\ Capacity\ Requirement = 136\ \frac{gal}{conn} * \frac{262{,}228\ EDU}{1.64} =$ $\mathbf{21.7\ MG}$
- $2028\ EST\ Capacity\ Requirement = 136\ \frac{gal}{conn} * \frac{318{,}707\ EDU}{1.64} =$ $\mathbf{26.4\ MG}$
- $Study\ Period\ Requirement = 26.4\ MG - 21.7\ MG = \mathbf{4.7\ MG}$

Allocation of Water Delivery / System Development / Elevated Storage Tanks Value to Impact Fee

Total available capacity for Middle Service Area is 21.9 MG

- $2018\ Capacity = 40.6\ MG$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ EST\ Capacity\ Requirement$
- $Existing\ Available\ Capacity = 40.6\ MG - 21.7\ MG = 18.9\ MG$
- $Future\ CIP\ Capacity = 3.0\ MG$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 18.9\ MG + 3.0\ MG = \mathbf{21.9\ MG}$

Impact fee eligible allocation for Middle Service Area is 21.4%

- $Allocation = \frac{Study\ Period\ Requirement}{Total\ Available\ Capacity}$
- $Allocation = \frac{4.7\ MG}{21.9\ MG} = \mathbf{21.4\%}$

Allocation of Water Delivery / System Development / Elevated Storage Tanks Value to Impact Fee

Low Service Area Study Period Requirement

- $2018\ EST\ Capacity\ Requirement = 103\ \frac{gal}{conn} * \frac{488{,}639\ EDU}{1.64} =$ $\mathbf{30.7\ MG}$
- $2028\ EST\ Capacity\ Requirement = 103\ \frac{gal}{conn} * \frac{567{,}086\ EDU}{1.64} =$ $\mathbf{35.6\ MG}$
- $Study\ Period\ Requirement = 35.6\ MG - 30.7\ MG = \mathbf{4.9\ MG}$

Allocation of Water Delivery / System Development / Elevated Storage Tanks Value to Impact Fee

Total available capacity for Low Service Area is 22.0 MG

- $2018\ Capacity = 48.2\ MG$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ EST\ Capacity\ Requirement$
- $Existing\ Available\ Capacity = 48.2\ MG - 30.7\ MG = 17.5\ MG$
- $Future\ CIP\ Capacity = 4.5\ MG$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 17.5\ MG + 4.5\ MG = \mathbf{22.0\ MG}$

Impact fee eligible allocation for Low Service Area is 22.4%

- $Allocation = \frac{Study\ Period\ Requirement}{Total\ Available\ Capacity}$
- $Allocation = \frac{4.9\ MG}{22.0\ MG} = \mathbf{22.4\%}$

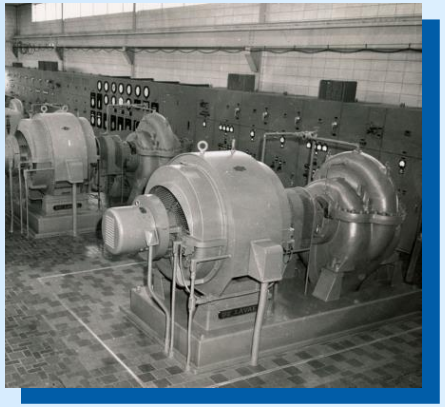
Water Delivery / System Development Components

Well Pumps

Elevated
Storage Tanks

Transmission
Mains

Ground Storage Tanks



High Service and
Booster Pump Stations

Water Delivery / System Development Value – Ground Storage Tanks

Existing value of ground storage tanks is $65,495,466

- Valuation method is Original Cost (OC)
- Value is not depreciated
- Value excludes contributed assets

Value of ground storage tanks CIP projects is $29,421,250

- Value is in 2018 dollars
- Value does not include financing costs

Allocation of Water Delivery / System Development / Ground Storage Tanks Value to Impact Fee

Allocation is based on TCEQ requirements

- TCEQ requires minimum 200 gallons per connection of storage capacity, but WIP may recommend a higher minimum for each service area
- $1\ connection = 1.64\ EDUs$
- $GST\ Capacity\ Requirement = Minimum\ gal/conn * \frac{No.\ EDUs}{1.64}$
- $Study\ Period\ Requirement = 2028\ GST\ Capacity\ Requirement - 2018\ GST\ Capacity\ Requirement$

Allocation of Water Delivery / System Development / Ground Storage Tanks Value to Impact Fee

High Service Area Study Period Requirement

- $2018\ GST\ Capacity\ Requirement = 13\ \frac{gal}{conn} * \frac{23{,}755\ EDU}{1.64} =$ $\mathbf{0.19\ MG}$
- $2028\ GST\ Capacity\ Requirement = 13\ \frac{gal}{conn} * \frac{30{,}600\ EDU}{1.64} =$ $\mathbf{0.24\ MG}$
- $Study\ Period\ Requirement = 0.24\ MG - 0.19\ MG =$ $\mathbf{0.05\ MG}$

Allocation of Water Delivery / System Development / Ground Storage Tanks Value to Impact Fee

Total available capacity for High Service Area is 10.6 MG

- $2018\ Capacity = 10.8\ MG$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ GST\ Capacity\ Requirement$
- $Existing\ Available\ Capacity = 10.8\ MG - 0.19\ MG = 10.6\ MG$
- $Future\ CIP\ Capacity = 0.0\ MG$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 10.6\ MG + 0.0\ MG = \mathbf{10.6\ MG}$

Impact fee eligible allocation for High Service Area is 0.5%

- $Allocation = \frac{Study\ Period\ Requirement}{Total\ Available\ Capacity}$
- $Allocation = \frac{0.05\ MG}{10.6\ MG} = \mathbf{0.5\%}$

Allocation of Water Delivery / System Development / Ground Storage Tanks Value to Impact Fee

Middle Service Area Study Period Requirement

- 2018 $GST\ Capacity\ Requirement = 64\ \frac{gal}{conn} * \frac{262{,}228\ EDU}{1.64} =$ $\mathbf{10.2\ MG}$
- 2028 $GST\ Capacity\ Requirement = 64\ \frac{gal}{conn} * \frac{318{,}707\ EDU}{1.64} =$ $\mathbf{12.4\ MG}$
- $Study\ Period\ Requirement = 12.4\ MG - 10.2\ MG = \mathbf{2.2\ MG}$

Allocation of Water Delivery / System Development / Ground Storage Tanks Value to Impact Fee

Total available capacity for Middle Service Area is 69.8 MG

- $2018\ Capacity = 67.5\ MG$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ GST\ Capacity\ Requirement$
- $Existing\ Available\ Capacity = 67.5\ MG - 10.2\ MG = 57.3\ MG$
- $Future\ CIP\ Capacity = 12.5\ MG$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 57.3\ MG + 12.5\ MG = \mathbf{69.8\ MG}$

Impact fee eligible allocation for Middle Service Area is 3.2%

- $Allocation = \frac{Study\ Period\ Requirement}{Total\ Available\ Capacity}$
- $Allocation = \frac{2.2\ MG}{69.8\ MG} = \mathbf{3.2\%}$

Allocation of Water Delivery / System Development / Ground Storage Tanks Value to Impact Fee

Low Service Area Study Period Requirement

- $2018\ GST\ Capacity\ Requirement = 97\ \frac{gal}{conn} * \frac{488{,}639\ EDU}{1.64} =$ $\mathbf{28.9\ MG}$
- $2028\ GST\ Capacity\ Requirement = 97\ \frac{gal}{conn} * \frac{567{,}086\ EDU}{1.64} =$ $\mathbf{33.5\ MG}$
- $Study\ Period\ Requirement = 33.5\ MG - 28.9\ MG = \mathbf{4.6\ MG}$

Allocation of Water Delivery / System Development / Ground Storage Tanks Value to Impact Fee

Total available capacity for Low Service Area is 72.7 MG

- $2018\ Capacity = 100.6\ MG$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ EST\ Capacity\ Requirement$
- $Existing\ Available\ Capacity = 100.6\ MG - 28.9\ MG = 71.7\ MG$
- $Future\ CIP\ Capacity = 1.0\ MG$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 71.7\ MG + 1.0\ MG = \mathbf{72.7\ MG}$

Impact fee eligible allocation for Low Service Area is 6.4%

- $Allocation = \frac{Study\ Period\ Requirement}{Total\ Available\ Capacity}$
- $Allocation = \frac{4.6\ MG}{72.7\ MG} = \mathbf{6.4\%}$

Water Delivery / System Development Components

Well Pumps

Elevated
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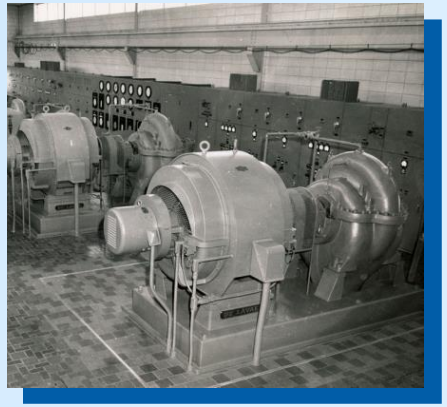
Transmission
Mains

Ground Storage Tanks



High Service and
Booster Pump Stations

Water Delivery / System Development Value – Pump Stations

Existing value of pump stations is $149,832,114

- Valuation method is Original Cost (OC)
- Value is not depreciated
- Value excludes contributed assets

Value of pump station CIP projects is $36,502,193

- Value is in 2018 dollars
- Value does not include financing costs

Allocation of Water Delivery / System Development / Pump Stations Value to Impact Fee

Allocation is based on maximum hour demand (MHD)

- Average day demand (ADD) and maximum hour peaking factor (MHPF) are found in *Water Infrastructure Plan*
- $Average\ Day\ Demand\ (ADD) = 121\ gpcd$
- $Maximum\ Hour\ Peaking\ Factor\ (MHPF) = 3.31$
- $MHD = ADD * MHPF * Population$
- $Study\ Period\ Demand = 2028\ MHD - 2018\ MHD$

Allocation of Water Delivery / System Development / Pump Stations Value to Impact Fee

High Service Area Study Period Requirement

- $2018\ MHD = 121\ gpcd * 3.31 * 56{,}774 = \mathbf{22.7\ mgd}$
- $2028\ MHD = 121\ gpcd * 3.31 * 73{,}134 = \mathbf{29.3\ mgd}$
- $Study\ Period\ Demand = 29.3\ mgd - 22.7\ mgd = \mathbf{6.6\ mgd}$

Allocation of Water Delivery / System Development / Pump Stations Value to Impact Fee

Total available capacity for High Service Area is 41.0 mgd

- $2018\ Capacity = 60.9\ mgd$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ MHD$
- $Existing\ Available\ Capacity = 60.9\ mgd - 22.7\ mgd = 38.2\ mgd$
- $Future\ CIP\ Capacity = 2.8\ mgd$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 38.2\ mgd + 2.8\ mgd = \mathbf{41.0\ mgd}$

Impact fee eligible allocation for High Service Area is 16.0%

- $Allocation = \frac{Study\ Period\ Demand}{Total\ Available\ Capacity}$
- $Allocation = \frac{6.6\ mgd}{41.0\ mgd} = \mathbf{16.0\%}$

Allocation of Water Delivery / System Development / Pump Stations Value to Impact Fee

Middle Service Area Study Period Requirement

- $2018\ MHD = 121\ gpcd * 3.31 * 626{,}725 = \mathbf{251.0\ mgd}$
- $2028\ MHD = 121\ gpcd * 3.31 * 761{,}709 = \mathbf{305.1\ mgd}$
- $Study\ Period\ Demand = 305.1\ mgd - 251.0\ mgd = \mathbf{54.1\ mgd}$

Allocation of Water Delivery / System Development / Pump Stations Value to Impact Fee

Total available capacity for Middle Service Area is 214.0 mgd

- $2018\ Capacity = 440.0\ mgd$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ MHD$
- $Existing\ Available\ Capacity = 440.0\ mgd - 251.0\ mgd = 189.0\ mgd$
- $Future\ CIP\ Capacity = 25.0\ mgd$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 189.0\ mgd + 25.0\ mgd = \mathbf{214.0\ mgd}$

Impact fee eligible allocation for Middle Service Area is 25.3%

- $Allocation = \frac{Study\ Period\ Demand}{Total\ Available\ Capacity}$
- $Allocation = \frac{54.1\ mgd}{214.0\ mgd} = \mathbf{25.3\%}$

Allocation of Water Delivery / System Development / Pump Stations Value to Impact Fee

Low Service Area Study Period Requirement

- $2018\ MHD = 121\ gpcd * 3.31 * 1{,}167{,}848 = \mathbf{467.7\ mgd}$
- $2028\ MHD = 121\ gpcd * 3.31 * 1{,}355{,}336 = \mathbf{542.8\ mgd}$
- $Study\ Period\ Demand = 542.8\ mgd - 467.7\ mgd = \mathbf{75.1\ mgd}$

Allocation of Water Delivery / System Development / Pump Stations Value to Impact Fee

Total available capacity for Low Service Area is 56.8 mgd

- $2018\ Capacity = 521.0\ mgd$
- $Existing\ Available\ Capacity = 2018\ Capacity - 2018\ MHD$
- $Existing\ Available\ Capacity = 521.0\ mgd - 467.7\ mgd = 53.3\ mgd$
- $Future\ CIP\ Capacity = 3.5\ mgd$
- $Total\ Available\ Capacity = Existing\ Available\ Capacity + Future\ CIP\ Capacity$
- $Total\ Available\ Capacity = 53.3\ mgd + 3.5\ mgd = \mathbf{56.8\ mgd}$

Impact fee eligible allocation for Low Service Area is 100%

- $Allocation = \frac{Study\ Period\ Demand}{Total\ Available\ Capacity}$
- $Allocation = \frac{75.1\ mgd}{56.8\ mgd} = \mathbf{132.2\%}$

Water Delivery / System Development Components

Well Pumps

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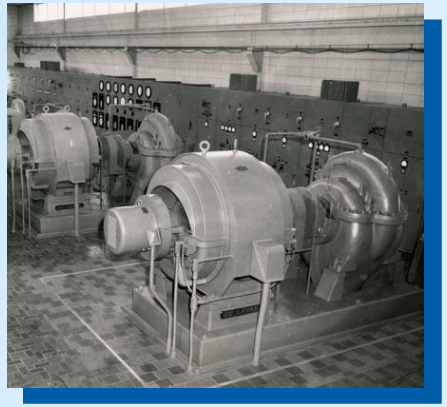

High Service and
Booster Pump Stations

Water Delivery / System Development Value – Transmission Mains

Existing value of transmission mains is **$64,207,721**

- Valuation method is Original Cost (OC)
- Value is not depreciated
- Value excludes contributed assets

Value of transmission mains CIP projects is **$123,753,410**

- Value is in 2018 dollars
- Value does not include financing costs

Allocation of Water Delivery / System Development / Transmission Mains Value to Impact Fee

Allocation is based on allocation of pump stations (MHD)

- High Service Area = 16.0%
- Middle Service Area = 25.3%
- Low Service Area = 100%

Water Delivery / System Development CIP – Eligible Value

Component	Service Area	Total Cost	Eligible %	Eligible Cost*
Pump Stations	High	$ 9,690,234	16.0%	$ 1,551,807
	Middle	53,312,519	25.3%	13,466,844
	Low	14,614,629	100%	14,614,629
Ground Storage	High	3,874,363	0.5%	19,863
	Middle	47,143,485	3.2%	1,488,835
	Low	29,504,009	6.4%	1,882,513
Elevated Storage	High	15,749,953	12.7%	2,004,684
	Middle	23,572,686	21.4%	5,042,643
	Low	31,770,484	22.4%	7,111,286
Well Pumps	All	48,265,475	42.5%	20,490,786
Transmission	High	26,249,982	16.0%	4,203,708
	Middle	102,413,739	25.3%	25,869,906
	Low	15,567,758	100%	12,708,826
TOTAL		**$ 421,729,316**	**26.2%**	**$ 110,456,330**

* Costs shown do not include financing charges.

Questions?