

Technical Memo: Sewer Rates Based on Winter Water Use

TO: Sue Gedestad, Public Works Department, City of Davis
 FROM: Greg Clumpner, Foresight Consulting
 DATE: February 9, 2008

OVERVIEW

On January 22, 2008, the City Council directed staff to modify the sewer rate structure to include residential rates based on winter water consumption and proceed with preparing the necessary prop 218 notifications. Although the City's commercial rates are currently based on winter water consumption, the primary purpose for switching the residential rates to a winter consumption basis is that it would improve rate equity among residential customers.

In directing staff to proceed with this action, both the City Council and Natural Resources Commission (NRC) asked City staff to re-evaluate how costs are allocated between the fixed and variable components of the rates. This memo provides that re-evaluation.

Several factors have changed since the last sewer rate study¹ was prepared, and since the Council reviewed the recent rate alternatives. These changes are:

- **Revenue Requirements** – have been adjusted to account for a new construction schedule for the treatment plant improvements and other changes.
- **Growth Assumptions** – We are now assuming no new growth in sewer customers for the next four years, whereas previously we assumed a 1%/year growth.
- **Water Use** – We have assumed a 3% reduction in residential winter water use in response to this new rate structure (i.e., a price-elasticity of demand response).
- **Cost Allocations** – We have used the same cost allocations used in the 2007 rate study except that 100% of the collection-related costs for residential customers were included in their fixed month charges. The overall effect of this change is that residential fixed monthly charges are smaller than presented to council last month.

RESULTS: RESIDENTIAL RATES BASED ON WINTER WATER USE

Table 1 summarizes the new residential rates based on winter water consumption.

Table 1

Residential Sewer Rates: Current Flat Rates & Rates Based on Winter Water Use (FY'08-09) City of Davis							
Residential Classes	Currently Adopted Flat Rates (\$/mo./acct.)	Rates Based on Winter Water Use				Typical Monthly Bill (a)	
		Fixed & Commodity Rates			Commodity (\$/hcf)	(\$/Billing Unit/mo.)	% Increase vs. Current Rates
		Fixed Charges (\$/mo./acct.)	(\$/mo./unit)				
Single Family	\$39.65	\$2.57	\$5.77	\$3.95	\$41.27	4.1%	
Single-Family Condo	\$30.80	\$2.57	\$4.39	\$3.95	\$32.03	4.0%	
M2 Duplex	\$29.92	\$2.57	\$4.39	\$3.95	\$30.73	2.7%	
M3 Triplex	\$31.02	\$2.57	\$4.72	\$3.95	\$32.56	5.0%	
M4 Quadplex	\$31.33	\$2.57	\$4.82	\$3.95	\$33.02	5.4%	
M5 5 + units	\$21.43	\$2.57	\$3.27	\$3.95	\$21.99	2.6%	
MH Mobile Homes	\$21.93	\$2.57	\$3.41	\$3.95	\$22.92	4.5%	
Total Residential Revenue	\$9,614,500				\$9,676,240		

a. Assumes that only one bill is sent to each duplex, triplex, quadplex, etc.

¹ Please refer to the Rate Study Report: Sewer Rates & Connection Fees, Foresight Consulting, April 16, 2007.

Table 2 summarizes the new commercial rates, which were calculated using the same methodology used in the 2007 rate study, except for the new factors discussed above.

Table 2

Commercial Rates: Current and New Rates (FY'08-09) City of Davis						
Commercial Classes	Current Rates		Commercial (w/ Winter Water Use for Resid. Rates)			
	Basic Rate	Variable Rate	Monthly/Basic Rate		Variable Rate	
	(\$/mo./acct.)	(\$/hcf)	(\$/mo./acct.)	% Increase (a)	(\$/hcf)	% Increase (a)
C1 Office/Retail	\$2.60	\$4.12	\$2.57	-0.9%	\$4.19	1.7%
C2 Laundry	\$2.60	\$4.20	\$2.57	-0.9%	\$4.27	1.8%
C3 All Other	\$2.60	\$4.12	\$2.57	-0.9%	\$4.19	1.7%
C4 Convalescent Hospital	\$2.60	\$4.39	\$2.57	-0.9%	\$4.47	1.8%
C5 Auto/Service Station	\$2.60	\$4.47	\$2.57	-0.9%	\$4.55	1.8%
C6 Restaurants	\$2.60	\$6.54	\$2.57	-0.9%	\$6.67	1.9%
C7 Industrial	\$2.60	\$4.65	\$2.57	-0.9%	\$4.58	-1.5%

a. Compared to current rates.

Single-Family Rates – The single-family bills by level of consumption are shown in **Figure 2**. The number of customers in each level of consumption is shown in **Figure 3**.

Figure 2

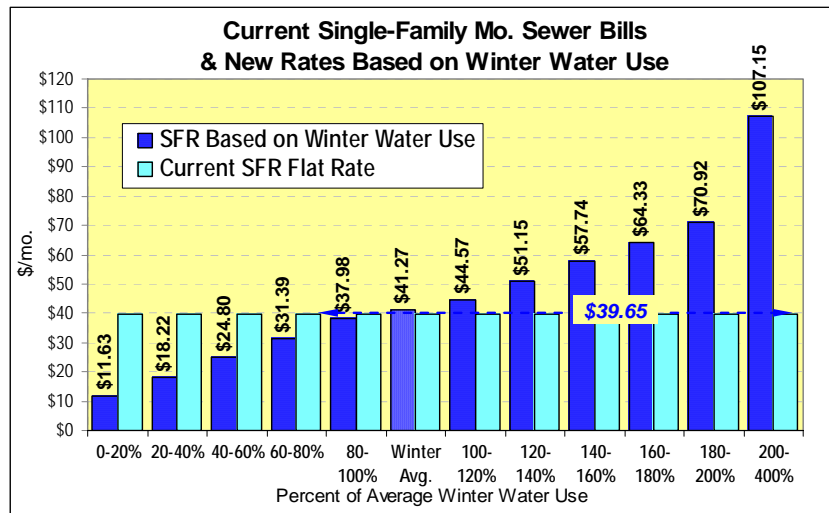
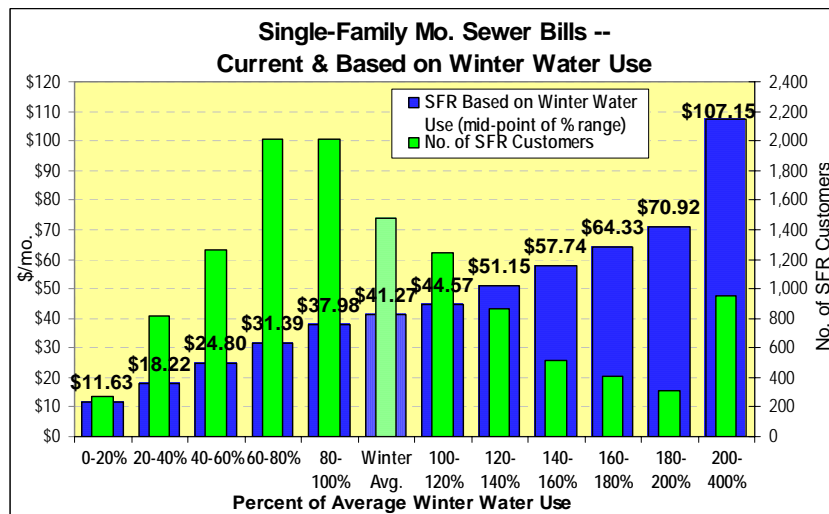


Figure 3



Appendix

This appendix presents tables and figures related to the updated residential and commercial rates shown above, including:

- Other residential rate results (figures of monthly bills by level of consumption)
- Summary of revenue requirements
- Summary of the financial plan, which is an update of the plan presented in the 2007 rate study
- New industrial rates

Other Residential Rates –

Figure A-1

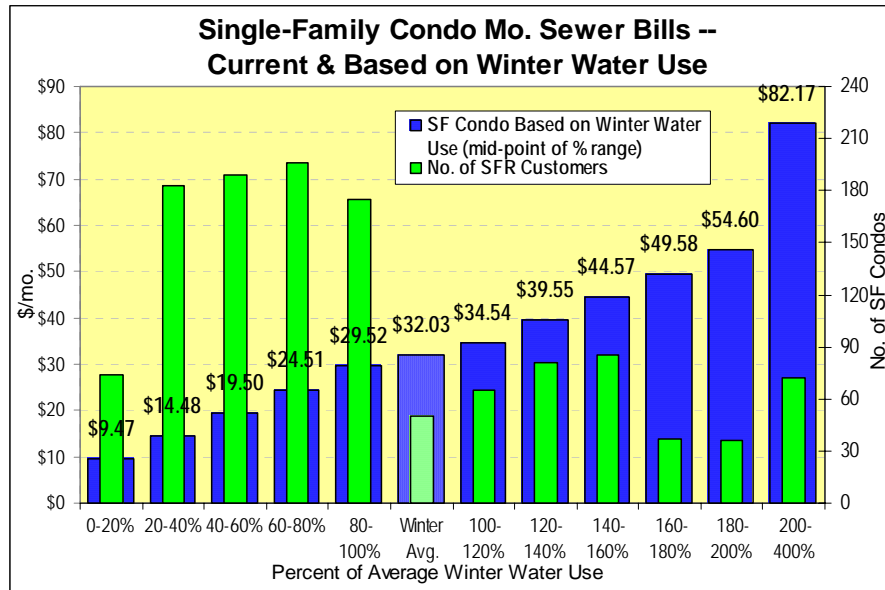
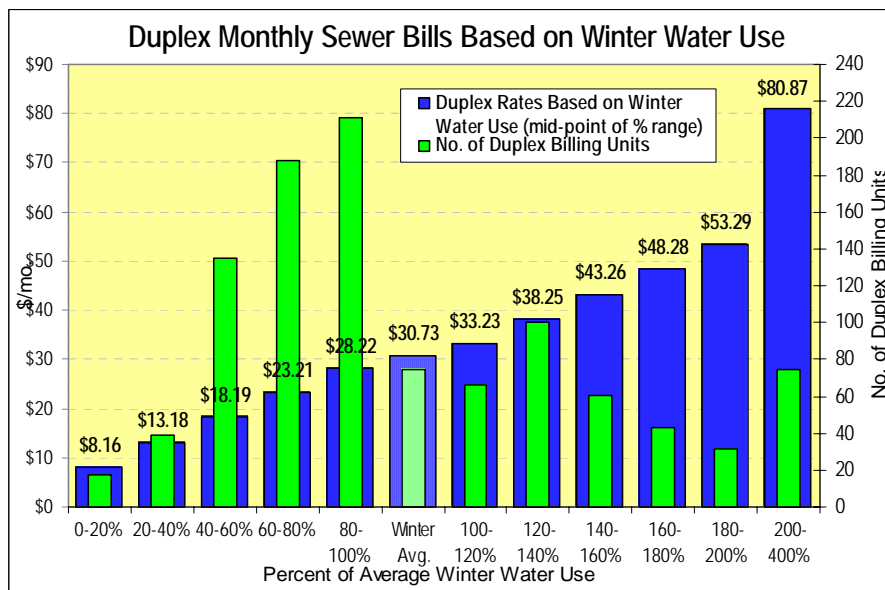


Figure A-2



Summary of Revenue Requirements –

Figure A-3

Summary of Projected Sewer Utility's Budget and Total Revenue Requirements										
City of Davis										
	Projected Budgets									
Maintenance & Operations	FY '07-08	FY '08-09	FY '09-10	FY '10-11	FY '11-12	FY '12-13	FY '13-14	FY '14-15	FY '15-16	FY '16-17
Total Collection	1,288,684	1,327,345	1,367,165	1,408,180	1,450,426	1,493,938	1,538,756	1,584,919	1,632,467	1,681,441
Total WWTP	4,643,197	4,782,493	4,925,968	5,073,747	5,225,959	5,382,738	5,544,220	5,710,547	5,881,863	6,058,319
Additional WWTP O&M (a)	-	-	-	-	-	1,780,000	3,660,000	3,770,000	3,880,000	4,000,000
Total WW Pre-Treatment	387,292	398,911	410,878	423,205	435,901	448,978	462,447	476,321	490,610	505,329
Additional Staff (b)	-	250,887	361,414	526,756	542,559	558,835	575,601	592,869	610,655	628,974
Total Inter-Dept. Charges	541,833	558,088	574,830	592,075	609,837	628,132	646,976	666,386	686,377	706,969
Total Sewer Division O&M	6,861,006	7,317,723	7,640,255	8,023,963	8,264,682	10,292,622	12,428,001	12,801,041	13,181,972	13,581,031
Other Division (531) Expenses (c)	335,562	345,628	355,997	366,677	377,678	389,008	400,678	412,698	425,079	437,832
Existing Debt Service (d)	597,482	603,545	609,873	616,477	623,379	630,585	638,110	645,963	654,149	654,149
Less: Non Rate Revenue	-	-	-	-	-	-	-	-	-	-
Total Before Capital Repl. Transfers	7,794,050	8,266,897	8,606,125	9,007,117	9,265,738	11,312,215	13,466,789	13,859,702	14,261,200	14,673,012
Transfers to Replacement Fund (532)	876,000	902,000	929,000	957,000	986,000	1,016,000	1,046,000	1,077,000	1,109,000	1,142,000
Total Revenue Requirements (e)	\$8,670,050	\$9,168,897	\$9,535,125	\$9,964,117	\$10,251,738	\$12,328,215	\$14,512,789	\$14,936,702	\$15,370,200	\$15,815,012
Expenditure Inflation Rate	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

- a. Based on Carollo estimate of \$2.45 mil. annual O&M for \$165 mil. new plant facilities plus 3% inflation from 2005, but only 50% for first year. Construction schedule is per Carollo's email to Keith Smith (9-15-06). Carollo's costs were adjusted to account for increase from \$140 mil to \$165 mil.
- b. Addition of Principal Engineer, full time Inspector and supervisor salary adjustments in FY'08-09. In FY'09-10 existing staff is augmented with contracted consultants.
- c. Expenses not directly shown in the Fund 531 Budget, including promotions (1160), utility accounting (2850), CIP Admin (8110), and WWTP facility planning & construction (8119).
- d. Includes portions of existing debt service (SRF loans, WWTP Expansion bond, and Interfund loan) that are allocated to existing customers per City documents.
- e. Total Revenue Requirements after transfers to Capital Replacement Fund Reserves (Fund 532)

Summary of Financial Plan –

Figure A-4

10-Year Financial Plan - Alternative Rate Increases										
<i>City of Davis</i>										
	FY'07-08	FY'08-09	FY'09-10	FY'10-11	FY'11-12	FY'12-13	FY'13-14	FY'14-15	FY'15-16	FY '16-17
Net Revenue Requirements (b)	\$ 8,670,050	\$ 9,168,897	\$ 9,535,125	\$ 9,964,117	\$ 10,251,738	\$ 12,328,215	\$ 14,512,789	\$ 14,936,702	\$ 15,370,200	\$ 15,815,012
<i>Annual % Increase over Previous Year</i>	-28.6%	5.8%	4.0%	4.5%	2.9%	20.3%	17.7%	2.9%	2.9%	2.9%
Baseline Alternative (Current Rates, No Rate Increases)										
Beginning O&M Fund Balance (531)	\$ 2,363,595	\$ 4,747,345	\$ 6,570,892	\$ 7,745,248	\$ 5,908,365	\$ 3,148,874	\$ (4,219,527)	\$ (14,985,190)	\$ (26,546,466)	\$ (38,951,240)
Revenue from Current Rates (c)	\$10,947,400	\$10,947,400	\$10,947,400	\$10,947,400	\$ 10,947,400	\$ 11,056,900	\$ 11,167,500	\$ 11,279,200	\$ 11,392,000	\$ 11,505,900
Interest Earnings (e)	\$ 106,400	\$ 213,600	\$ 295,700	\$ 348,500	\$ 265,900	\$ 141,700	\$ (189,900)	\$ (674,300)	\$ (1,194,600)	\$ (1,752,800)
less Add'l Debt Service for WWTP	\$ -	\$ (168,556)	\$ (533,618)	\$ (3,168,666)	\$ (3,721,053)	\$ (6,238,786)	\$ (7,230,474)	\$ (7,229,474)	\$ (7,231,974)	\$ (7,522,724)
less Net Revenue Req't's.	<u>\$ (8,670,050)</u>	<u>\$ (9,168,897)</u>	<u>\$ (9,535,125)</u>	<u>\$ (9,964,117)</u>	<u>\$ (10,251,738)</u>	<u>\$ (12,328,215)</u>	<u>\$ (14,512,789)</u>	<u>\$ (14,936,702)</u>	<u>\$ (15,370,200)</u>	<u>\$ (15,815,012)</u>
Ending O&M Fund Balance (531)	\$ 4,747,345	\$ 6,570,892	\$ 7,745,248	\$ 5,908,365	\$ 3,148,874	\$ (4,219,527)	\$ (14,985,190)	\$ (26,546,466)	\$ (38,951,240)	\$ (52,535,876)
Proposed New Rates - Avg. Winter Water Use for Residential Rates										
<i>Rate Increase</i>	5.0%	5.0%	6.0%	8.0%	10.0%	10.0%	10.0%	8.0%	6.0%	6.0%
<i>Implementation Dates</i>	8/1/07	8/1/08	8/1/09	8/1/10	8/1/11	8/1/12	8/1/13	8/1/14	8/1/15	8/1/16
Beginning O&M Fund Balance (531)	\$ 2,363,595	\$ 4,747,345	\$ 7,118,262	\$ 9,554,275	\$ 10,010,604	\$ 10,963,447	\$ 8,971,757	\$ 5,499,248	\$ 3,069,997	\$ 1,471,316
Revenue from Current Rates (c)	\$10,947,400	\$10,947,400	\$10,947,400	\$10,947,400	\$ 10,947,400	\$ 11,056,900	\$ 11,167,500	\$ 11,279,200	\$ 11,392,000	\$ 11,505,900
Add'l. Rev. from Rate Increases	\$ -	\$ 547,370	\$ 1,237,056	\$ 2,211,813	\$ 3,527,734	\$ 5,025,012	\$ 6,699,553	\$ 8,210,225	\$ 9,473,393	\$ 10,832,551
Interest Earnings (d)	\$ 106,400	\$ 213,600	\$ 320,300	\$ 429,900	\$ 450,500	\$ 493,400	\$ 403,700	\$ 247,500	\$ 138,100	\$ 66,200
less Add'l Debt Service for WWTP (e)	\$ -	\$ (168,556)	\$ (533,618)	\$ (3,168,666)	\$ (3,721,053)	\$ (6,238,786)	\$ (7,230,474)	\$ (7,229,474)	\$ (7,231,974)	\$ (7,522,724)
less Baseline Net Revenue Req't's.	<u>\$ (8,670,050)</u>	<u>\$ (9,168,897)</u>	<u>\$ (9,535,125)</u>	<u>\$ (9,964,117)</u>	<u>\$ (10,251,738)</u>	<u>\$ (12,328,215)</u>	<u>\$ (14,512,789)</u>	<u>\$ (14,936,702)</u>	<u>\$ (15,370,200)</u>	<u>\$ (15,815,012)</u>
Ending O&M Fund Balance (531)	\$ 4,747,345	\$ 7,118,262	\$ 9,554,275	\$10,010,604	\$ 10,963,447	\$ 8,971,757	\$ 5,499,248	\$ 3,069,997	\$ 1,471,316	\$ 538,232
<i>Assumed Customer Growth Rate</i>	1.00%	0.00%	0.00%	0.00%	0.00%	1.00%	1.00%	1.00%	1.00%	1.00%
<i>Coverage Ratio</i>	6.41	7.42	7.49	3.29	3.33	1.89	1.21	1.05	0.96	0.94

a. Unless noted otherwise, from Final Budget 2005-2006 (as shown in Table titled "Summary of Projected Sewer Operating Budgets, Debt Service and Net Revenue Requirements")

b. Revenue required from rates. From Table B-1, "Summary of Projected Sewer Operating Budgets, Debt Service and Net Revenue Requirements"

c. Based on '06-07 revenue of \$10,839,025 from Sue Gedestad, 1-28-09. Personal communication.

d. Interest earnings based on previous year's ending fund balance and an assumed interest rate of 4.5%.

e. From Northcross, Hill & Ach, LLC. 1/28/08 email.

Summary of Industrial Rates –

Figure A-5

Summary of Industrial COS Unit Costs (FY'08-09)					
<i>City of Davis</i>					
Customer Type	Mo. Service Charge (a)	Unit Costs for Industrial Users			
		Flow		BOD	TSS
	\$/acct.	\$/mgd	\$/hcf	\$/lb.	\$/lb.
Industrial (b)	\$2.57	\$1,865,409	\$3.8228	\$0.33522	\$0.18441
Raw Effluent (c)	\$2.57	\$1,503,980	\$3.0821	\$0.42026	\$0.23119

a. From Table COS-S4.

b. From Table COS-S1. Assumes industrial charges are based on winter water use or metered effluent.

This charge is more appropriate if industrial customers are charged based on winter average flow.

c. This charge is more appropriate if industrial customers are charged based on metered/monitored flow.

Methodology Used for the City's Sewer Rates

The two figures below provide a general overview of the approach to the cost-of-service methodology used to calculate the new winter water use-based sewer rates.

Figure A6 – Cost-of-Service Approach (Part 1 of 2)

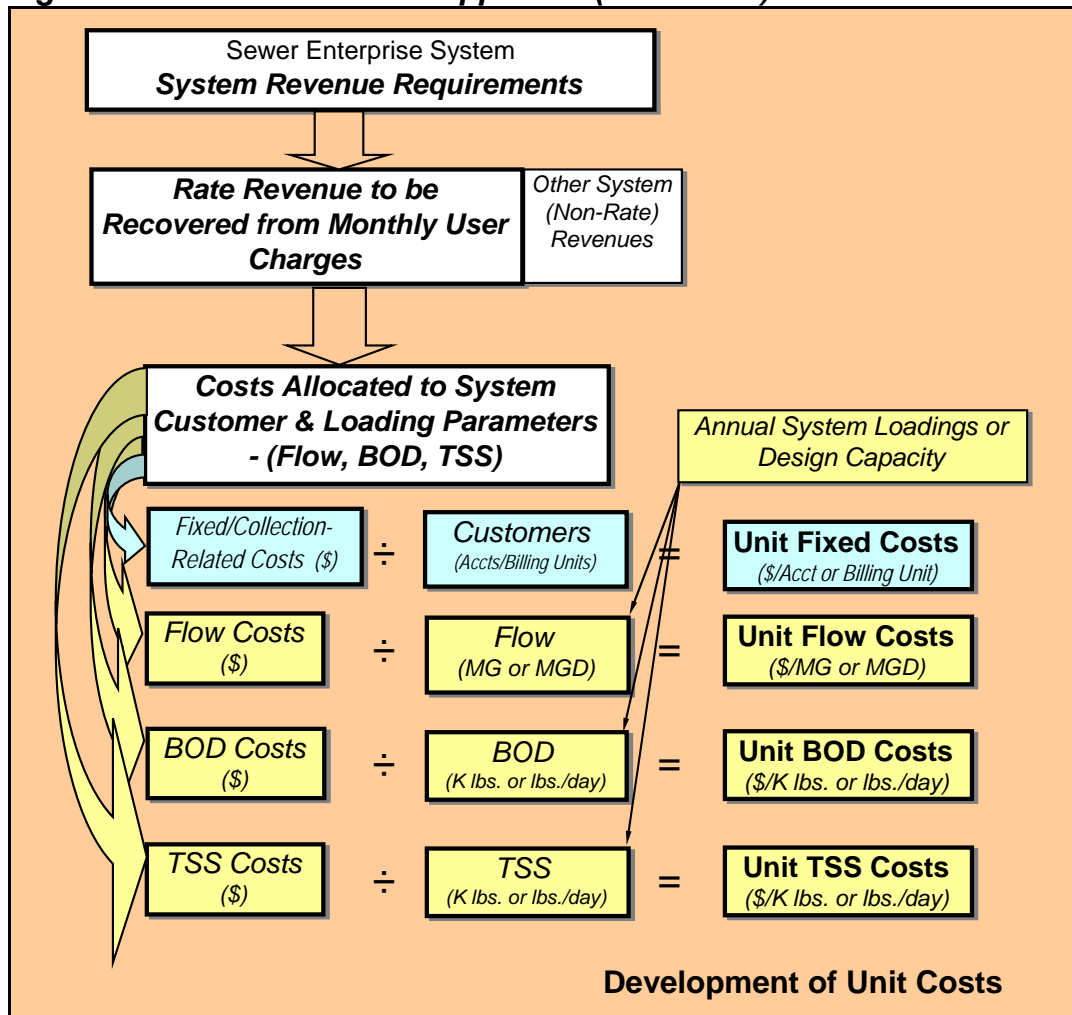


Figure A7 – Part 2 of Cost-of-Service Approach (Part 2 of 2)

