
2017 Michigan Section AWWA Annual Conference

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Agenda

• Annual Sewer Rate Update
• Customer Satisfaction
• Improve Billing Accuracy
• Challenges and Lessons
• Conclusions
City of Grand Rapids Annual Sewer Rate Update

• 1st week of November distributed for customer communities review
• Revise based on feedback
• Effective January 1st the following year

Wholesale Communities:
• City of East Grand Rapids
• Ada Township
• Caledonia Township
• Gaines Charter Township

Retail customers:
• City of Grand Rapids
• City of Walker
• City of Kentwood
• Cascade Charter Township
• Grand Rapids Charter Township
• Tallmadge Charter Township
• Wright Township
Zonegating Flow Segments Update

- Matching cost record
- 151 Flow Segments

Zonegating
Flow Segment: S-1
Customer A: xx mgd
Customer B: xx mgd
Customer C: xx mgd
.....
# City of Grand Rapids Annual Sewer Rate Update

## CITY OF GRAND RAPIDS, MICHIGAN

### SEWAGE DISPOSAL SYSTEM FUND

### ANNUAL RATE REVIEW

### Table of Contents

<table>
<thead>
<tr>
<th>Task No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inventory of Plant and Equipment</td>
<td>S 1</td>
</tr>
<tr>
<td>2</td>
<td>Cost of Plant and Equipment</td>
<td>S 1</td>
</tr>
<tr>
<td>3</td>
<td>Source of Funding for Plant and Equipment</td>
<td>S 1</td>
</tr>
<tr>
<td>4</td>
<td>Operating Costs for the Test Period</td>
<td>S 2</td>
</tr>
<tr>
<td>5</td>
<td>Adjustments to Operating Costs</td>
<td>S 4</td>
</tr>
<tr>
<td>6</td>
<td>Sewer Volumes and Revenues</td>
<td>S18</td>
</tr>
<tr>
<td>7</td>
<td>Other Operating Revenues</td>
<td>S21</td>
</tr>
<tr>
<td>8</td>
<td>Changes in Operating Levels</td>
<td>S22</td>
</tr>
<tr>
<td>9</td>
<td>Changes in Operating Revenues</td>
<td>S23</td>
</tr>
<tr>
<td>10</td>
<td>System Additions and Retirements</td>
<td>S24</td>
</tr>
<tr>
<td>11</td>
<td>Fixed Assets-Cost, Accumulated Depreciation &amp; Depreciation</td>
<td>S25</td>
</tr>
<tr>
<td>12</td>
<td>Working Capital Needs</td>
<td>S26</td>
</tr>
<tr>
<td>13</td>
<td>Joint Use Facilities-Zonegated</td>
<td>S27</td>
</tr>
<tr>
<td>14</td>
<td>Verification of System Map</td>
<td>S31</td>
</tr>
<tr>
<td>15</td>
<td>Construction Cost Rate Base</td>
<td>S32</td>
</tr>
<tr>
<td>15a</td>
<td>Integrated Sewer Connection Fees</td>
<td>S33</td>
</tr>
<tr>
<td>16</td>
<td>CSO Debt Service Requirements</td>
<td>S36</td>
</tr>
<tr>
<td>16A</td>
<td>Future Non-Integrated Improvements</td>
<td>S37</td>
</tr>
<tr>
<td>17</td>
<td>Outstanding Debt Service on Senior Bonds</td>
<td>S38</td>
</tr>
<tr>
<td>18</td>
<td>Sewer System Equity</td>
<td>S39</td>
</tr>
<tr>
<td>19</td>
<td>Rate of Return-Bond Buyer's Index</td>
<td>S40</td>
</tr>
<tr>
<td>20</td>
<td>Composite Rate of Return</td>
<td>S41</td>
</tr>
<tr>
<td>21</td>
<td>Rate of Return by Customer Community</td>
<td>S42</td>
</tr>
<tr>
<td>22</td>
<td>Adjusted Operating Cost by Customer Community-Zonegated</td>
<td>S47</td>
</tr>
<tr>
<td>23</td>
<td>Other Operating Revenues by Customer Community</td>
<td>S48</td>
</tr>
<tr>
<td>24</td>
<td>Depreciation Expense by Customer Community</td>
<td>S49</td>
</tr>
<tr>
<td>25</td>
<td>Revenue Requirement Summary by Customer Community</td>
<td>S50</td>
</tr>
<tr>
<td>25a</td>
<td>Revenue Requirements-Bond Ordinance Provision</td>
<td>S51</td>
</tr>
<tr>
<td>26</td>
<td>Comparative Summary of System Revenue Levels</td>
<td>S52</td>
</tr>
<tr>
<td>26 / 27</td>
<td>Revenue Levels / Rate Schedules by Customer Community</td>
<td>S54</td>
</tr>
<tr>
<td>28</td>
<td>Front Foot Charges</td>
<td>S76</td>
</tr>
<tr>
<td>29</td>
<td>Sewer Lateral Charges</td>
<td>S77</td>
</tr>
<tr>
<td>30</td>
<td>Surcharges for BOD, TSS, Phosphorus &amp; Ammonia</td>
<td>S79</td>
</tr>
<tr>
<td>30a</td>
<td>Concentrated Waste Surcharge Adjustment Methodology</td>
<td>S84</td>
</tr>
<tr>
<td>31</td>
<td>Industrial Pretreatment Permit &amp; Laboratory Fees</td>
<td>S87</td>
</tr>
<tr>
<td>32</td>
<td>Sanitary Sewer Oversizing</td>
<td>S93</td>
</tr>
<tr>
<td>33</td>
<td>Utility Service District Areas</td>
<td>S94</td>
</tr>
<tr>
<td>34</td>
<td>Circuit Breaker -- Individual and City &amp; Customer Community</td>
<td>S95</td>
</tr>
<tr>
<td>35</td>
<td>Footing Drain Opt Out Sewer Rate</td>
<td>S96</td>
</tr>
</tbody>
</table>
Annual Sewer Rate Update

Allocate cost based on Actual use of the pipes

Use = annual average flow
Customer loadings haven’t been updated since 2003

- Customer loadings needed to be developed at 151 Flow Segments
- 37 Flow meters in 2003
2016 Update

More than 100 Meters

Real-time Flow Monitoring Data Since 2013

Augment Flow Data

All-pipe model calibrated under 2014 condition developed in 2015
"Why has my sewer rate increased more than my neighbors?"

Concerned Customer
What Matters to a Customer?

• What has changed from last year?
• It doesn’t look right:
  • Is the service area correct?
  • Did you use the best available data?
  • Is the calculation correct?
### Customer Comments

![Image of a customer comments table](image-url)

The table above contains detailed customer feedback, categorized by various factors such as product performance, customer service, and overall satisfaction. Each row represents a different customer, while columns detail specific aspects of their experience. The color-coded entries highlight areas of concern and commendable performance. Further analysis and improvement strategies can be derived from this data.
We found things we overlooked in previous study
The City of Grand Rapids Wastewater Collection System
- 127 mi² Service Area
- 11 Customer Communities

Monitoring Network
- 5 wholesale meters
- 101 permanent flow meters
- 7 SCADA runtime data feed
All-pipe InfoSWMM Model
• Incorporated latest GIS
• Calibrated using 2014 Flow Data

> 24,000 Pipes
The Problem

151 Flow Segments
Vs
100 Flow Meters
Dry Weather Hydrology

- Base Sanitary Flow
- Groundwater Infiltration

Flow vs. Time of Day

Avg. Day Flow
Metered BSF Flow: 0.32 mgd
Water Bill: 0.1 + 0.3 = 0.4 mgd

80% of water returning to sewer

Sewer Loadings:
A: 0.1 x 80% = 0.08 mgd
B: 0.3 x 80% = 0.24 mgd

Dry Weather Hydrology

Manhole A
Water Bill: 0.1 mgd

Manhole B
Water Bill: 0.3 mgd
Estimate 2016 Loadings

Manhole A
Simulated Loading: 0.1 mgd

Manhole B
Simulated Loading: 0.3 mgd

2016 Sewer Loadings:
A: 0.1 x 80% = 0.08 mgd
B: 0.3 x 80% = 0.24 mgd

Metered Flow: 0.32 mgd
Simulated Flow: 0.1 + 0.3 = 0.4 mgd
2016 Loading is 80% simulated loading
Routing the Flow – 2016 SWMM Method

SWMM5 Zonegating Model
- 254 junctions
- 6 dividers
- 264 conduits

Water Quality Module Enables Tracing of Flow Sources
Challenges and Lessons

- Data Quality
- Big Data
Data Quality Issues

- High accuracy flow meters
  - At WWTP and MAPS
  - High accuracy
- Permanent flow meter data
  - Available at 100 locations
  - Accurate under normal condition
- All-pipe model simulated flow
  - Available at manhole level
  - Least accurate
Big Data Principles

- Explore more problems
- Focus on automation
- Stick with simple models

Conclusions

- 2016 Zonegating update greatly improved accuracy of the results by augmenting flow data with model simulation results
- Customer communities are satisfied with the results which are considered more accurate and transparent
- The significant improvement of the process directly benefited from the city’s continued investments in a modern digital asset
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Leadership – Digital Asset Investment

GIS
> 10 years effort

Flow Data
Since 2013

Model
2015

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