

Cost of Service Study

Chicory Road Interceptor Sewer Conveyance Upgrade

for

Racine Wastewater Utility

August 25, 2021



Project: Chicory Road Interceptor Sewer Conveyance Upgrade

Problem/Issue

High flows in the Chicory Road interceptor sewer can produce excessive surcharging, causing basement flooding and bypass flow at Safety Site 11. In May 2020, a large rain event caused extensive basement flooding in Mount Pleasant, particularly in the neighborhood southwest of the intersection of Chicory Road and Lathrop Avenue (see Figure 1). Other areas along the Chicory Road interceptor sewer have also experienced basement flooding recent years. Communities contributing flow to the Chicory Road interceptor are the Village of Mount Pleasant and the City of Racine.

Solution

The Chicory Road interceptor sewer basin was studied in 2021 to determine the cause of basement flooding and safety site bypassing, and to evaluate measures that could alleviate flooding and bypassing. From this study, one of the recommended alternatives (Alt 6b) included approximately 10,000 lineal feet of conveyance upgrades from Lathrop Avenue to the downstream connection with the Mount Pleasant-Sturtevant (MPS) interceptor sewer (near the Bryn Mawr meter as shown on Figure 1). This conveyance upgrade will provide surcharge relief in the interceptor sewer and thereby eliminate basement flooding and bypassing at SS11, up to the design event. Upsizing a short segment of sewer along Knoll Place is also required.

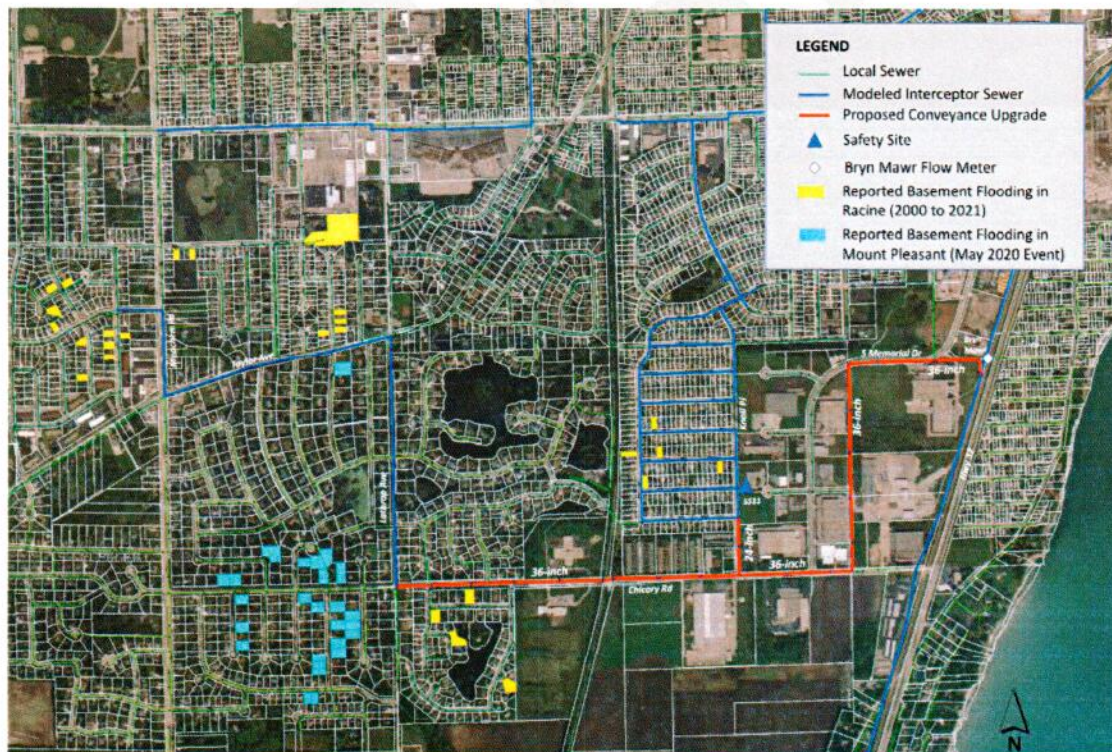


Figure 1. Chicory Road Interceptor Sewer Conveyance Upgrades (Alt 6b)

Racine Wastewater Utility
Cost Allocation Study
Chicory Road Interceptor Sewer Conveyance Upgrade

I. Introduction

Based on the recommendations of the 2020 Racine RWU Facilities Plan and the June 2021 Brown and Caldwell Chicory Road Sewer Basin Evaluation technical memo, the Racine Wastewater Commission is proposing to construct a project referred to as the Chicory Road Interceptor Sewer Conveyance Upgrade. This improvement will provide additional conveyance capacity and alleviate system surcharging.

According to the terms of the 2002 Sewer Service Agreement, a cost-of-service allocation is required for any new facilities that expand the capacity of the Commission's wastewater treatment or conveyance system. This report summarizes the proposed cost of service allocation for the proposed Chicory Road Interceptor Sewer Conveyance Upgrade.

II. General Framework of the Agreement

The Sewer Service Agreement defines different types of capital costs and specifies different approval processes and methods of funding for each.

"Existing Capital Costs" are defined in Section 1.32 as all capital costs expended by the Racine Utility prior to the date of the Agreement. The Utility retains sole ownership of "existing capital costs" and is allowed under Section 6.4 of the Agreement to charge a rate of return on them through the sewer rates.

"Minor Unplanned Upgraded Facilities" are paid for by the Utility and are recovered through the sewer rates, as if they were "existing capital costs". These facilities must meet the following criteria:

1. They are unplanned—that is, not contemplated in the 1998 facility plan.
2. They are upgrades to the sewer service facilities—they do not provide an increase in treatment capacity or conveyance capacity.
3. Their costs must total less than \$2,000,000 per year (adjusted annually for inflation).

As outlined in Section 3.5, there is no cost-of-service allocation for these facilities. However, the Commission must notify all the parties following its decision to treat capital costs as existing capital costs under this provision.

"Unplanned Upgraded Facilities" that are not treated as existing capital are paid for directly by each party in proportion to their current percentage share of total Allocated Treatment Capacity. As defined in Sections 1.114 and 1.115, these facilities must meet

criteria 1 and 2 above. Under Section 3.4, these facilities require the preparation of a cost-of-service allocation and 40 days prior written notice to all the parties.

"Unplanned Expanded Facilities", defined in Sections 1.33 and 1.114, are facilities not contemplated in the 1998 facility plan that create additional treatment or conveyance capacity. Under Section 3.6, these facilities do not have to be provided unless one or more parties agree to accept and pay for the additional capacity. A cost-of-service allocation must be prepared, and each of the parties pay for the capital cost in proportion to the amount of the expanded capacity purchased.

III. Cost of Service Allocation

Since the proposed project will provide additional conveyance capacity over and above the existing capacity, the cost should be treated as "Unplanned Expanded Facilities". The cost should be allocated according to the additional conveyance capacity requested by each of the parties.

The estimated cost for this project, including a 20 percent contingency, is \$14,520,000.

A two-step process was used to allocate the costs for the proposed storage:

1. Determine the existing allocated conveyance capacity and projected future capacity needs for areas contributing to the proposed facility.
2. Allocate the costs based on the projected increases in conveyance capacity needs for each of the parties.

Each of the steps is described below.

Step 1: Determine Existing and Future Conveyance Capacity Allocations

The attached Table 1 shows the existing allocated capacity for each of the areas contributing to the proposed facility. The contributing areas include all areas that are tributary to the Chicory Road interceptor sewer upgrade to the Mount Pleasant-Sturtevant interceptor, as modeled by Brown and Caldwell.

Table 1 also shows the projected future capacity needs for each of the metered and unmetered areas contributing to the proposed facility. The flow contribution for Mount Pleasant is based on the modeled 2040 conveyance system flows for a 5-year 6-hour recurrence storm event, less the Racine flow contribution. Flow contribution by Racine was determined by using a unit-area flow rate multiplied by the area in question.

Step 2: Allocate Costs

The costs were allocated between the parties based on the percentage of additional conveyance capacity needed by each party. The additional capacity was determined based on the amount by which each party is projected to exceed its existing allocated capacity by 2040. This was computed by subtracting the party's existing capacity from its

projected 2040 flows. As shown in Table 1, the total capacity exceedance is projected to be 6.942 million gallons per day (MGD), of which Mount Pleasant accounts for 72.5 percent and Racine accounts for 27.5 percent. Therefore, the costs are proposed to be allocated 72.5 percent to Mount Pleasant and 27.5 percent to Racine.

If any of the parties were to request capacity other than what is projected by the system modeling, the change in requested capacity would result in variation from this proposed cost-of-service allocation.

Table One

**Racine Wastewater Utility
Cost Allocation
Chicory Road Conveyance**

DRAFT - ALTERNATIVE 6B

FLows TO MOUNT PLEASANT-STURTEVANT INTERCEPTOR

	Mount Pleasant	Racine	Total
Community Flow Allocations			
Original 2020 Design Capacity (Peak Flow MGD) ⁽¹⁾			
Mt. Pleasant Contribution	5.873		
Racine Contribution ⁽²⁾		2.149	
Total	5.873	2.149	8.022
2040 Mike Urban Model Flows (Peak Flow MGD)			
Mt. Pleasant Contribution	10.908		
Racine Contribution ⁽³⁾		4.056	
Total	10.908	4.056	14.964
Compute Exceedance of Capacity			
Revised Capacity Allocation	10.908	4.056	14.964
less:			
Original Facility Capacity Allocation	5.873	2.149	8.022
Exceedance	5.035	1.907	6.942
Exceedance Share (maximum 100%, Minimum 0%)	72.5%	27.5%	100%
Compute Community Cost Shares			
Project Cost (Expanded Facility Cost) ⁽⁴⁾	\$14,520,000		
Downstream Benefit Share	-		
Total for Cost Allocation	\$14,520,000		
Mount Pleasant Share	\$10,532,012		
Racine Share	3,987,988		
Total	\$14,520,000		

Notes

1. Source: 2020 Facilities Plan Flows (Hydra Model Results)
2. Unmetered area. Flow contribution determined using a unit area flow rate of 4,693 gal/ac multiplied by 458 acres. Unit flow was calculated using the hydra model peak flow at the E. Chicory Rd. Meter location divided by 1,283 acres.
3. Unmetered area. Flow contribution determined using a unit area flow rate of 8,856 gal/ac multiplied by 458 acres. Unit flow was calculated using the MIKE URBAN model results at the E. Chicory Rd Meter location for the 2040 5-yr design storm, divided by 1,283 acres.
4. Project Cost from Brown and Caldwell Technical Memorandum, "Chicory Road Sewer Basin Evaluation" Alternative 6b including a 20% contingency for construction, design, and construction administration.