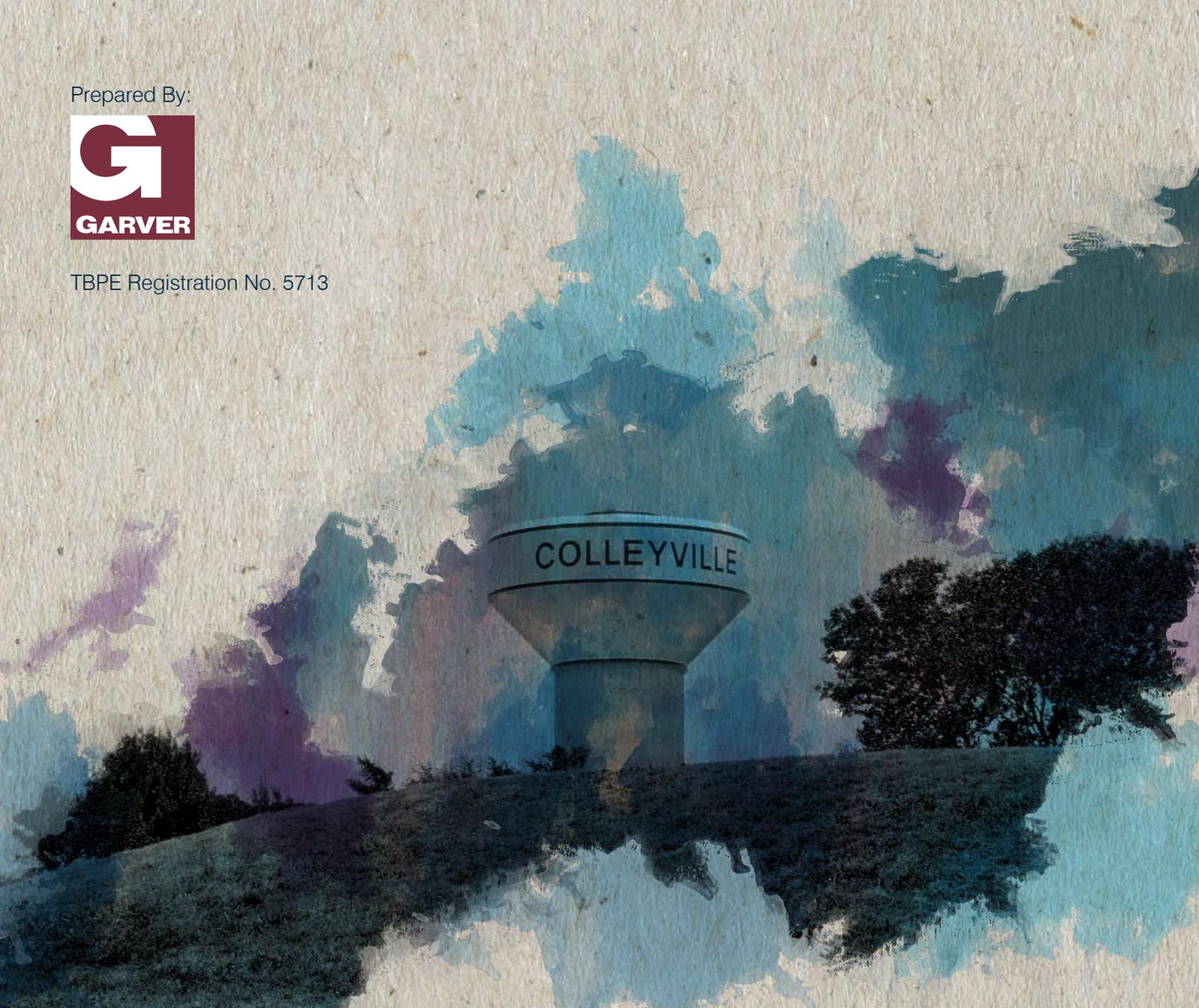


Prepared By:



TBPE Registration No. 5713



EXECUTIVE SUMMARY

Water and Wastewater Master Plan

DECEMBER 2014



CITY HALL

INTRODUCTION

The City of Colleyville is a wholesale customer of the Trinity River Authority (TRA) for treated water and wastewater treatment. The City does not own or operate any water or wastewater treatment facilities. Therefore, Colleyville's conveyance and storage infrastructure is critical to providing adequate water and sewer services to its citizens.

The City commissioned this Water and Wastewater Master Plan in order to evaluate the current condition of the existing infrastructure, and to adequately prepare for future growth and facility maintenance through a 20-year planning period. The project team has documented the existing system condition, identified

future growth and usage for the 20-year Master Plan life cycle, and has developed a 20-year, \$55 million capital improvements plan (CIP), which will allow the City to properly maintain the existing infrastructure investments and plan for the future.

THIS EXECUTIVE SUMMARY CONTAINS

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FIELD EVALUATIONS AND FINDINGS

Garver conducted field evaluations and condition assessments for key infrastructure of both the water and wastewater system.

WATER SYSTEM

The City purchases wholesale treated water from TRA, and has the ability to receive this water from four metered take points. The southern meter is located at Jackson and Cheek-Sparger, the western meter is located at 4892 Bransford Road, the eastern meter is located at

5485 Pool Road, and the northwest meter, which supplies the L.D. Lockett Pump Station, is on Glade Road at Little Bear Creek in Hurst.

CONDITION EVALUATION

Garver conducted a condition evaluation of the pump stations and storage tanks which identified minor needed improvements, such as tank painting, site drainage, and site security which are captured in a separate capital improvements project.



The Overland Trail Ground Storage Tank is in poor physical condition. The Master Plan recommends decommissioning this tank.

WASTEWATER SYSTEM

Twelve major sewer drainage basins exist within the City, and send flow to two TRA interceptors. A northern interceptor follows Big Bear Creek, ranges in size from 12-inch to 15-inch, and accepts four of the twelve major basins. A southern interceptor runs along Little Bear Creek, ranges in size from 36-inch to 42-inch, and accepts the

THE CITY'S WATER SYSTEM CONSISTS OF:



200 MILES OF PIPELINES



TWO PRESSURE PLANES
High - Low

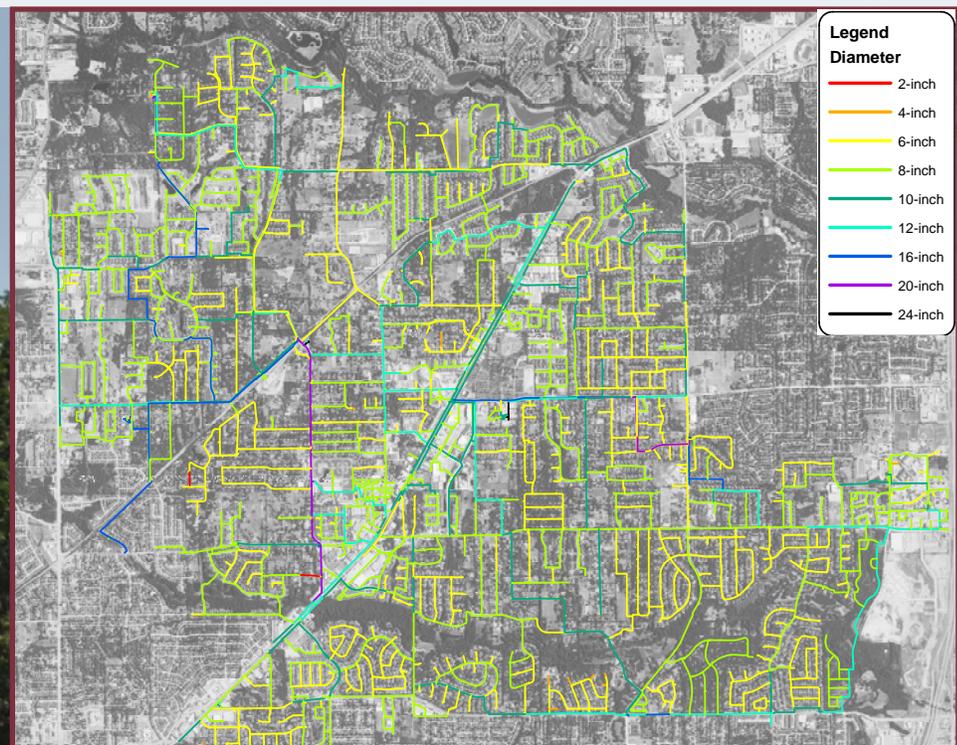


TWO PUMP STATIONS AND GROUND STORAGE TANKS
Overland Trail & L.D. Lockett



THREE ELEVATED STORAGE TANKS
Bransford, Hall-Johnson, and McPherson

The assessment also determined the Overland Trail Ground Storage Tank was in poor condition and in need of extensive rehabilitation if it were to be placed back into service.



CURRENT WATER SYSTEM

remaining eight drainage basins. Several studies were conducted as a part of this Master Plan to evaluate the condition of the existing infrastructure and evaluate current flow rates.

CONDITION EVALUATION

Garver conducted a site investigation of the two major lift stations. The evaluation assessed the condition of items such as mechanical infrastructure, controls, operation, instrumentation, safety, environmental issues, and site drainage. The overall condition of the wastewater lift stations is good, with only minor fencing improvements necessary.

MANHOLE ASSESSMENT

A manhole condition assessment was conducted by the project team on 37 percent of the system

manholes. Each identified manhole was inspected for defects, photographed on interior and exterior, and surveyed by coordinates and address.

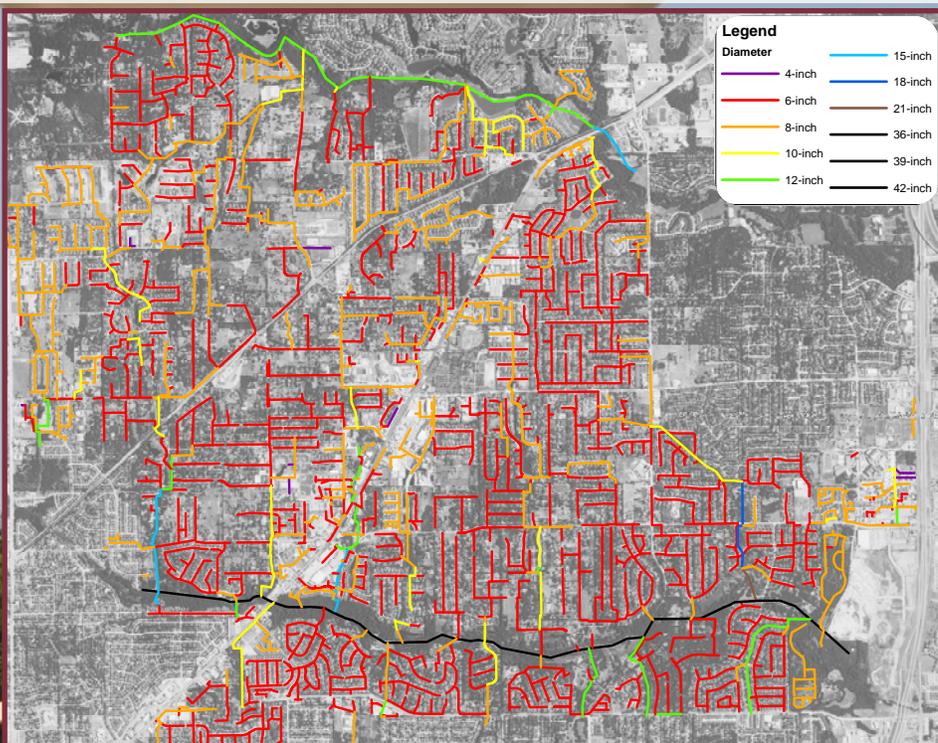
The assessment found that a majority of the system's manholes are in good condition and do not require any form of rehabilitation. However, 35 percent of the assessed manholes were determined to require some form of rehabilitation.

The assessed manholes were categorized by priority and placed into capital improvements projects to address the deficiencies.

Remaining manhole conditions were projected based on these findings, and incorporated as future condition-based projects.

FLOW MONITORING

Flow monitoring was conducted to establish current dry and wet weather flows. The study found the overall system inflow and infiltration is low, with approximately 1.2 percent of the annual sewer flow due to rain events. This information was utilized to project future flow rates during storm events, to determine what flow rates the system would see during the 20-year projected planning period.



CURRENT WASTEWATER SYSTEM

THE CITY'S WASTEWATER SYSTEM CONSISTS OF:



838,997 LINEAR FEET OF SANITARY SEWERS



3,029 MANHOLES



TWO LIFT STATIONS
Overland Trail and Reserve

MODEL DEVELOPMENT

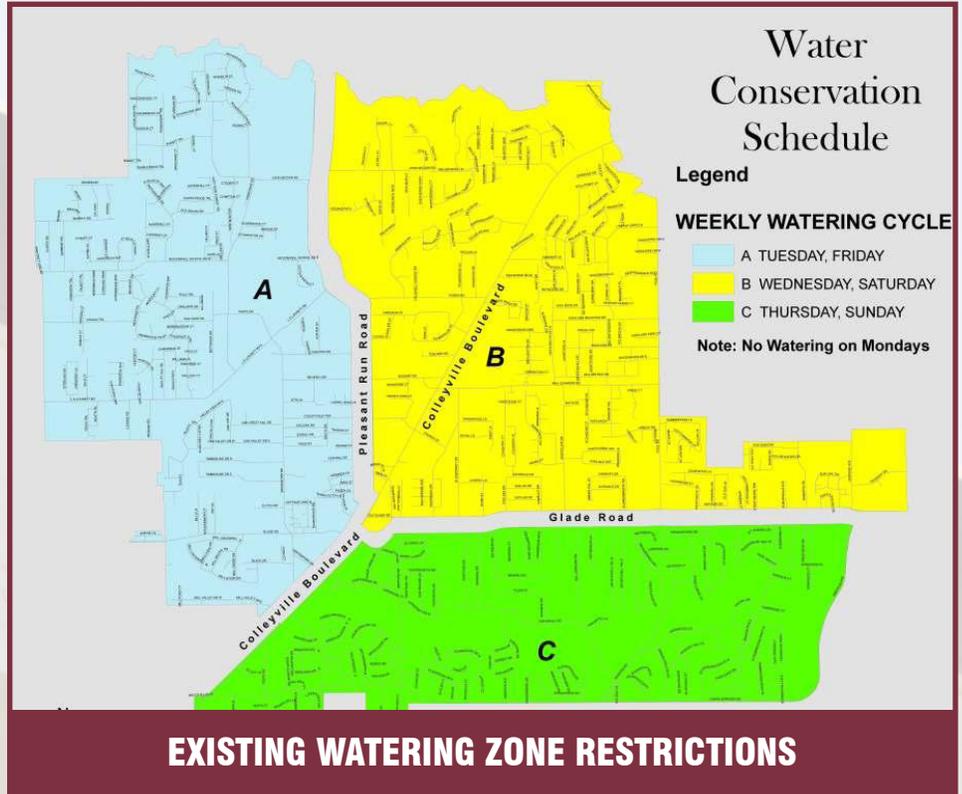
Bently WaterGEMS and SewerGEMS and the City's existing GIS database was used to model current and future flow rates in the water and wastewater systems.

These programs allow the user to input elevations, pipe types, tower sizes, pump sizes, demands, etc. The output allows the engineer to determine what improvements are needed to meet the anticipated flow rates.

As a result of the effort, the City has an accurate, computerized model of their existing infrastructure. This model allows the City to plan for future growth, evaluate existing system operation, and ensure future improvements follow the City's road map for growth and service.

WATERING ZONE RESTRICTIONS

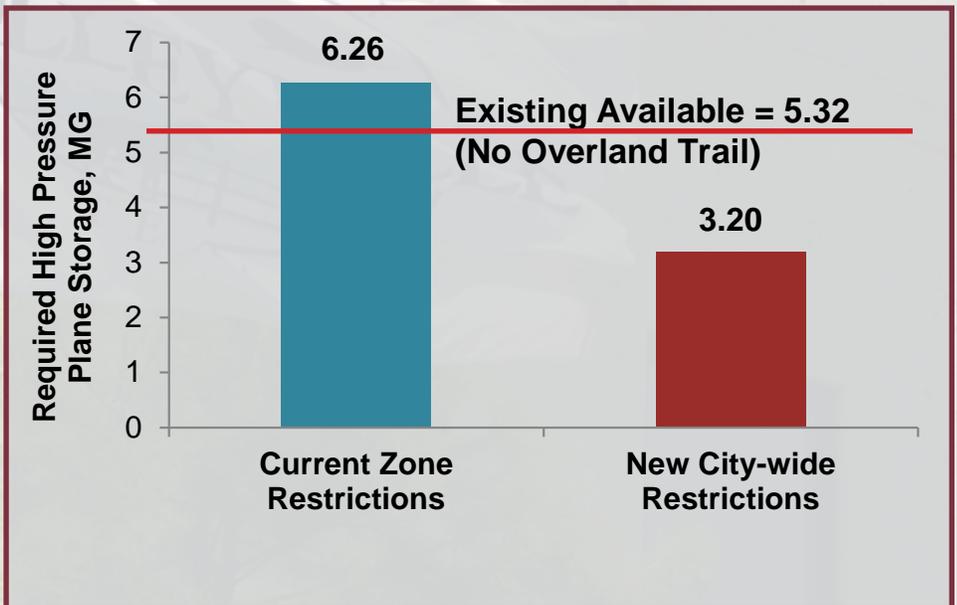
The model determined that the existing watering zone restrictions were causing large regionalized demands. These regionalized demands required the need for major additional infrastructure. This is illustrated in the bar chart to the right, which demonstrates the reduced high plane storage necessary if a new city-wide watering schedule, different from the current geographic-based schedule, is implemented. If existing restrictions remain in place, it is anticipated that a minimum of 1 million gallons of additional storage



would be needed for the high plane alone, through a new storage tank or renovation of the existing Overland Trail Ground Storage Tank.

This Master Plan recommends changing the zoned watering restrictions to an even-odd watering

day restriction. The proposed modifications to the watering zone restrictions in the Master Plan will save the City approximately \$5 million in additional infrastructure.



CIP DEVELOPMENT

Capital improvement triggers, for both water and wastewater projects, were identified and utilized to classify a deficiency and determine when a project is necessary. Those projects are referenced by the following primary triggers.

TRIGGERS

Regulatory This trigger includes TCEQ regulations, such as minimum pressures and flow rates.

Capacity This trigger is activated if a section of the system is unable to provide the necessary flow rate, or if the water system does not have storage during peak demand.

Fire Flow This trigger is activated if the suggested fire flows are not met in a specific area.

Condition Condition triggers are based upon deteriorating conditions of existing infrastructure that is near or past its useful life.

City-Identified This trigger is activated for areas the City has identified as areas of concern or the need for additional infrastructure, such as upsized piping along Colleyville Boulevard to provide for future growth. Projects previously identified by the City prior to this master plan fall here as well.

Operational Operational triggers are activated when a project will address a known operation and maintenance issue, such as deteriorated pipelines in need of replacement that currently require increased maintenance.

Overall, 27 water projects and 17 wastewater projects were developed to address the challenges discovered. The total 20-year CIP is \$54.9M in 2015 dollar estimates of which \$48,943,000 was identified by this master planning effort.

In order to determine the order of the recommended improvements, the projects were then ranked by the following priority:

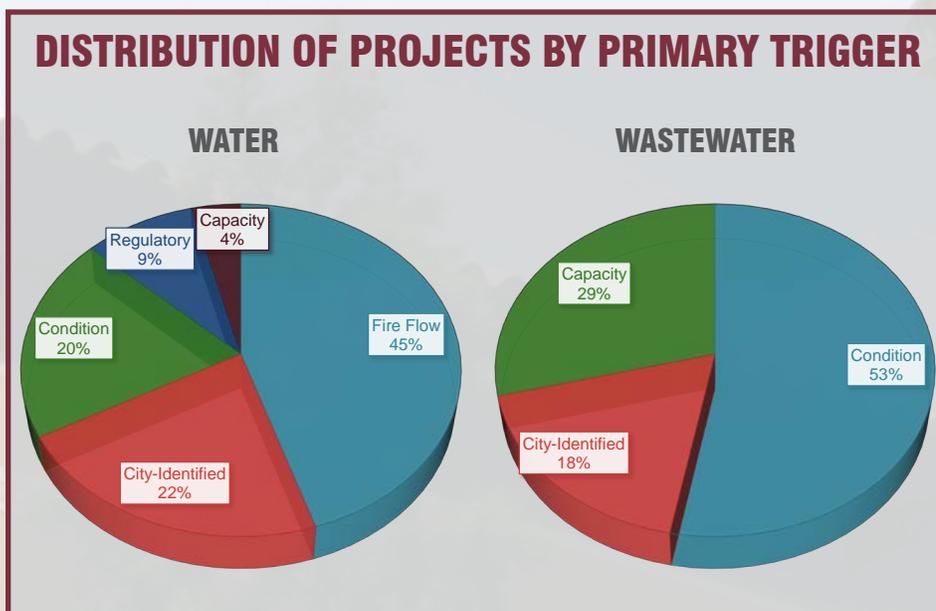
Regulatory and Capacity triggers take first precedence	
Flexibility impact precedence	
Water	Sewer
Fire flow improvements are less flexible	More limited capacity decreases flexibility
Similar triggers are grouped geographically when possible	

RATE STUDY SUMMARY

In conjunction with the Master plan, a rate study was conducted to evaluate if the City's current rate structure accurately recovers expenses of operating and maintaining the system. The following modifications are recommended to the rate structure:

- Implement standard volumetric rates for initial monthly 2,000 gallons of usage
- Differentiate the minimum charge for non-residential services
- Utilize meter size-based minimum billing

These modifications are recommended to allow the City's water and sewer revenues to more fully recover fixed expenses.





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