Michigan Municipal Executives Summer Workshop

July 19th – 22nd

Grand Valley Metro Council's (GVMC)

Regional Geographic Information System (REGIS)

GVMC

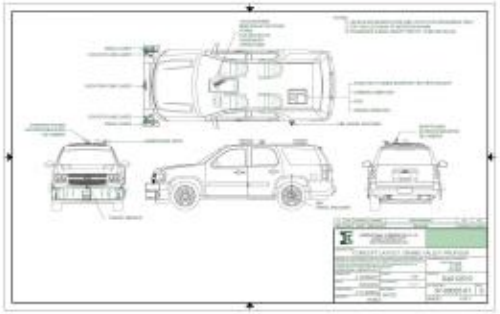
- Ensure Trust
- Credibility and Confidence
- Cooperation
- Collaboration
- Partnerships

Metropolitan Planning Organization (MPO)

Environmental Programs

REGIS
REGIONAL GEOGRAPHIC INFORMATION SYSTEM

GVMC ASSET MANAGEMENT VEHICLE



JOB MANAGEMENT • DRIVE SOFTWARE

DESIGNED TO SIMPLIFY

Simplifies the collection of quality road data with built-in calibration schedules, real-time quality control, GIS maps, section tracking, audible alerts, voice memos, and exception reporting.

Project Setup
Meet each unique project requirement with custom session controls.

GIS Integration
Import the road network from a shapefile, collect against the map, and see progress in real-time.

Centralized Quality Control
Warnings and errors from all subsystems are streamed into a single notification window.

Built-In Calibration Schedules
Data integrity is everything and making sure the calibrations are up to date and complete by scheduled in automation ensures this.

DATA MANAGEMENT • CONNECT SOFTWARE

DESIGNED TO AUTOMATE

Automates the major steps in data processing which includes matching collected data to the road network (GIS) with distress identification and reporting.

Data Collection
Collection of images, IRI (International Roughness Index), rutting, and faulting, among other pavement metrics.

Real-Time Data Displays
Preview images that assist the operator in collecting quality data and creating visual events editing as they go.

Automatic Matching
Matches collected data to an exportable road network file.

Built-In Quality Control
Keeps entire processing and reporting workflow in one application to avoid human error often introduced with sequential, step-by-step processes.

Rich Visualization, Reporting, and Export Versatility of Data
Export to Excel, CSV, KML/KMZ, and SHP to allow sharing of the data in a useful fashion.

VEHICLE HARDWARE COMPONENTS

FORWARD/REAR VIDEO LOG IMAGES

Delivers up to 10 frames per second at 9 MP resolution.

RUTTING

A five-point laser system meeting AASHTO requirements is capable of measuring changes in wheel path depth, comparing the valleys and crests of a roadway profile.

LONGITUDINAL PROFILING SYSTEM

Capable of collecting profile data at speeds up to 75 mph (Height sensors and accelerometers combined help determine the IRI, or roughness profile of the road).

GPS

Highly accurate position receiver/antennae provides positional accuracy in coordination with velocity and time data.

DISTANCE MEASURING UNIT (DMI)

Instrument capable of precisely measuring in increments of feet, miles, meters or Kilometers.

GVMC Programs Featured in Media Outlets

- MiBiz: West Michigan
- Detroit News
- Other Media Outlets…

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The Detroit News

News Sports Autos Business Michigan Life + Home Entertainment [Opinion] Obituaries

There are several "dig once" success stories from Michigan agencies. For example, the Detroit Water and Sewerage Department and the city of Detroit General Services Department are collaborating on an extensive stormwater management project in Rouge Park that will also include drinking water and sanitary sewer upgrades. The excavated soil will be used in a redesign of Riverside Park next to the Ambassador Bridge.

While such examples remain relatively rare, the opportunities for collaboration are extensive. Many people are working hard to make them more common. Three efforts stand out:

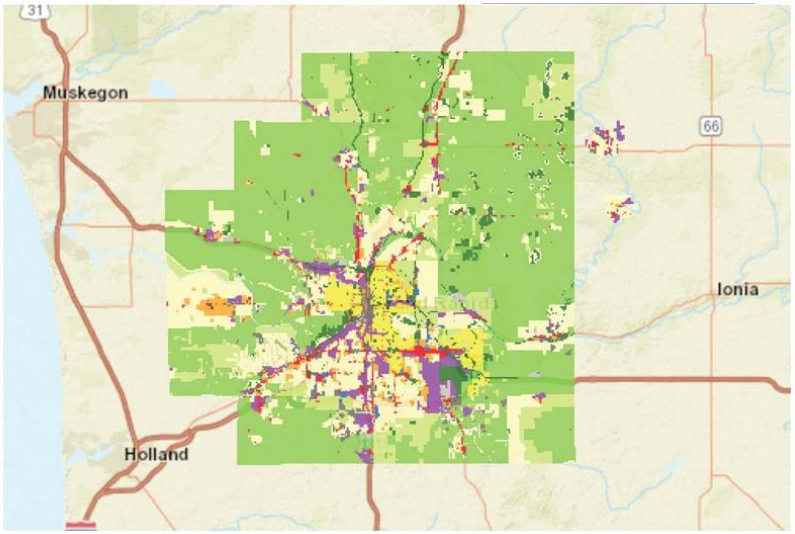
► In the Detroit metro area, the Southeast Michigan Council of Governments has recently established the Capital Improvement Project Coordination Tool. This password-protected geodatabase allows all types of infrastructure and utility owners to upload their capital improvement plans to enhance collaboration with other infrastructure owners.

► On the west side of the state, the Grand Valley Metropolitan Council oversees a consortium of communities and utility providers called REGIS, an acronym for "Regional Geographic Information System." This system provides a common database and suite of applications and interfaces to satisfy the spatial data management needs of all participant members. By participating in REGIS, member communities share valuable information, provide better and more consistent service to constituents and reduce operating costs. REGIS has been active more than 20 years and served as the template for a statewide effort overseen by the Michigan Infrastructure Council (MIC).

Advertisement

MiBiz

Published in **Economic Development**



The **Grand Valley Metropolitan Council**, which serves as the centralized hub of information for 39 West Michigan municipalities, has been using AI and machine learning to store, analyze and forecast data to plan for regional growth.

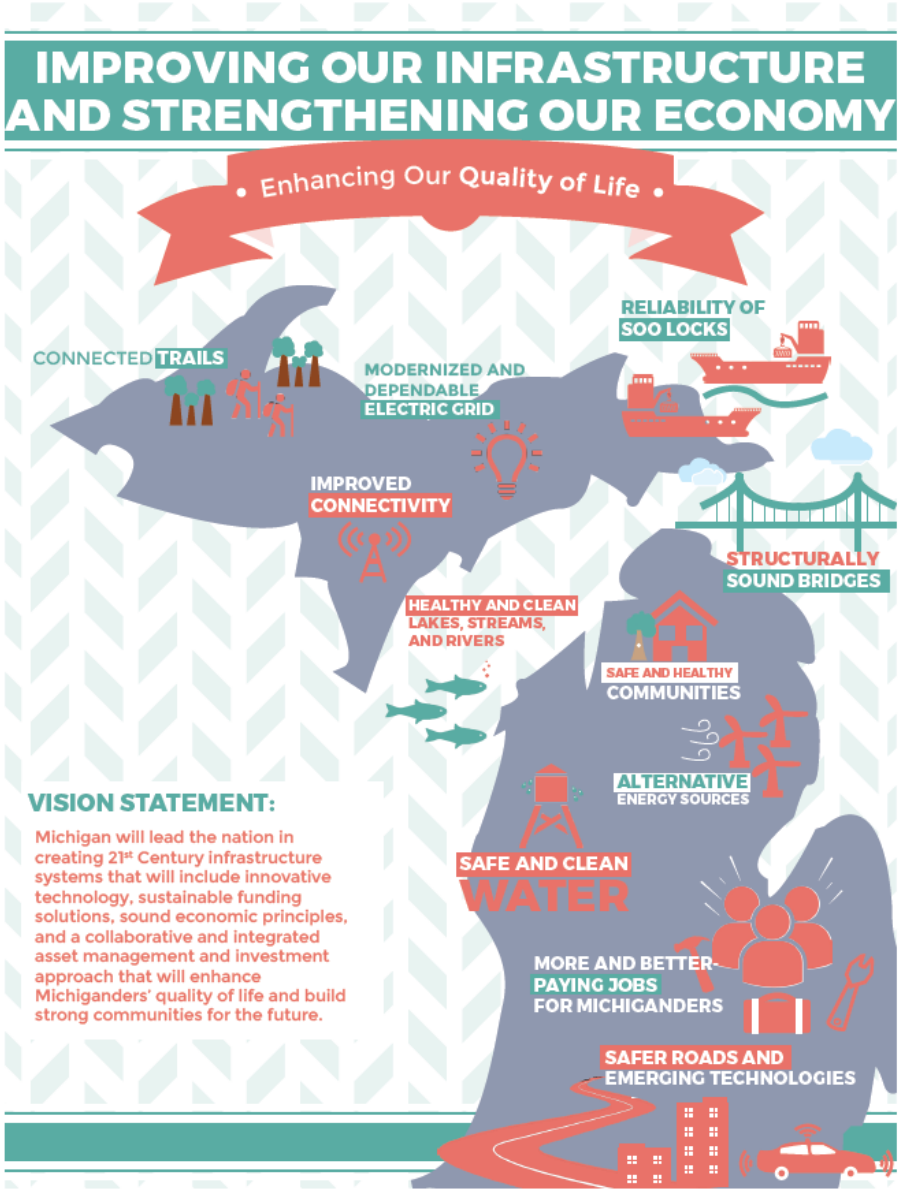
The council employs AI as it helps coordinate government services across the region. This includes overseeing a regional geographic information system, known as REGIS, and using transportation modeling and forecasting to let municipalities know when they should invest in infrastructure improvements.

The biggest role of REGIS is housing data and tracking it for cities, said Jason Moore, GIS Manager of REGIS for GVMC.

GVMC

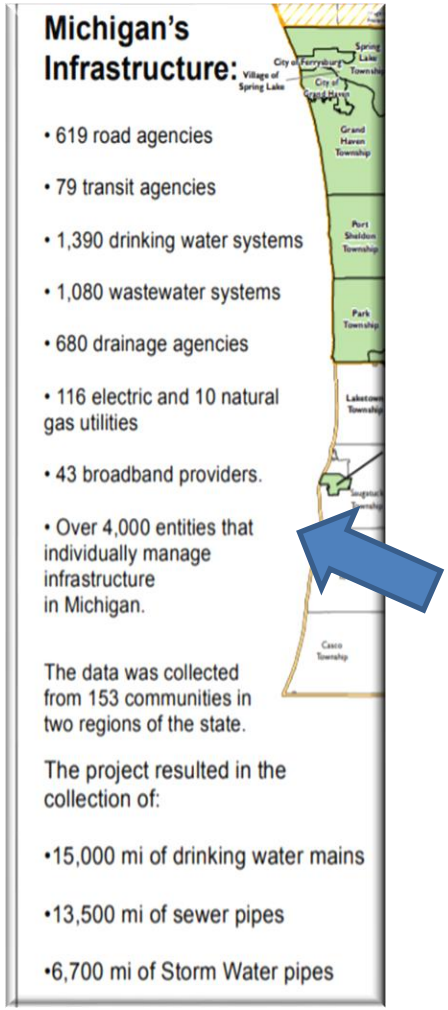
Michigan's Future

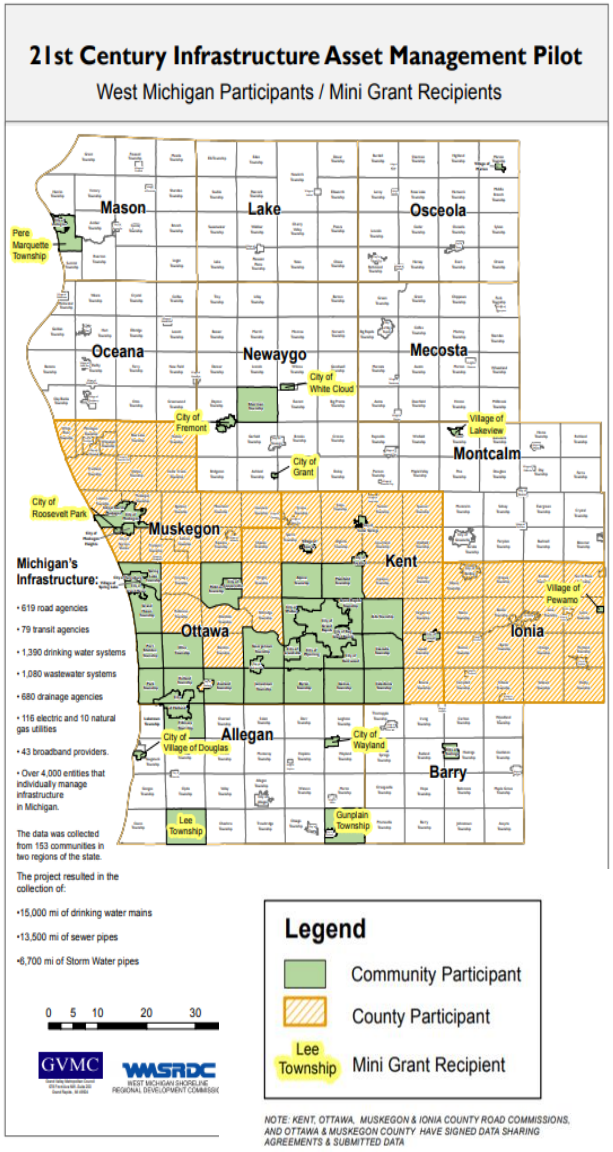
- Funding mechanisms for asset management and water infrastructure
- April 2018 Pilot Report Due
- Statewide Asset Management Implementation by Council



Michigan Infrastructure Asset Management Pilot

West Michigan Participants





The data was collected from 153 communities in two regions of the state.

MIC Council Members

John Weiss

Chairperson, Appointed by the Senate Majority Leader - Term expires 12/31/2023

Kathleen Lomako

Vice-Chairperson, Appointed by the House Minority Leader - Term expires 12/31/2022

Marco Bruzzano

Appointed by the Governor, Term Expires 12/31/2024

Jon Kangas

Appointed by the Governor - Term expires 12/31/2022

Erin Kuhn

Appointed by the Governor - Term expires 12/31/2024

Palencia Mobley

Appointed by the Governor - Term expires 12/31/2023

Daniel Fredendall

Appointed by the Speaker of the House - Term expires 12/31/2023

John H. Daly III, Ph.D

Appointed by the Senate Minority Leader - Term expires 12/31/2022

Beverly Watts

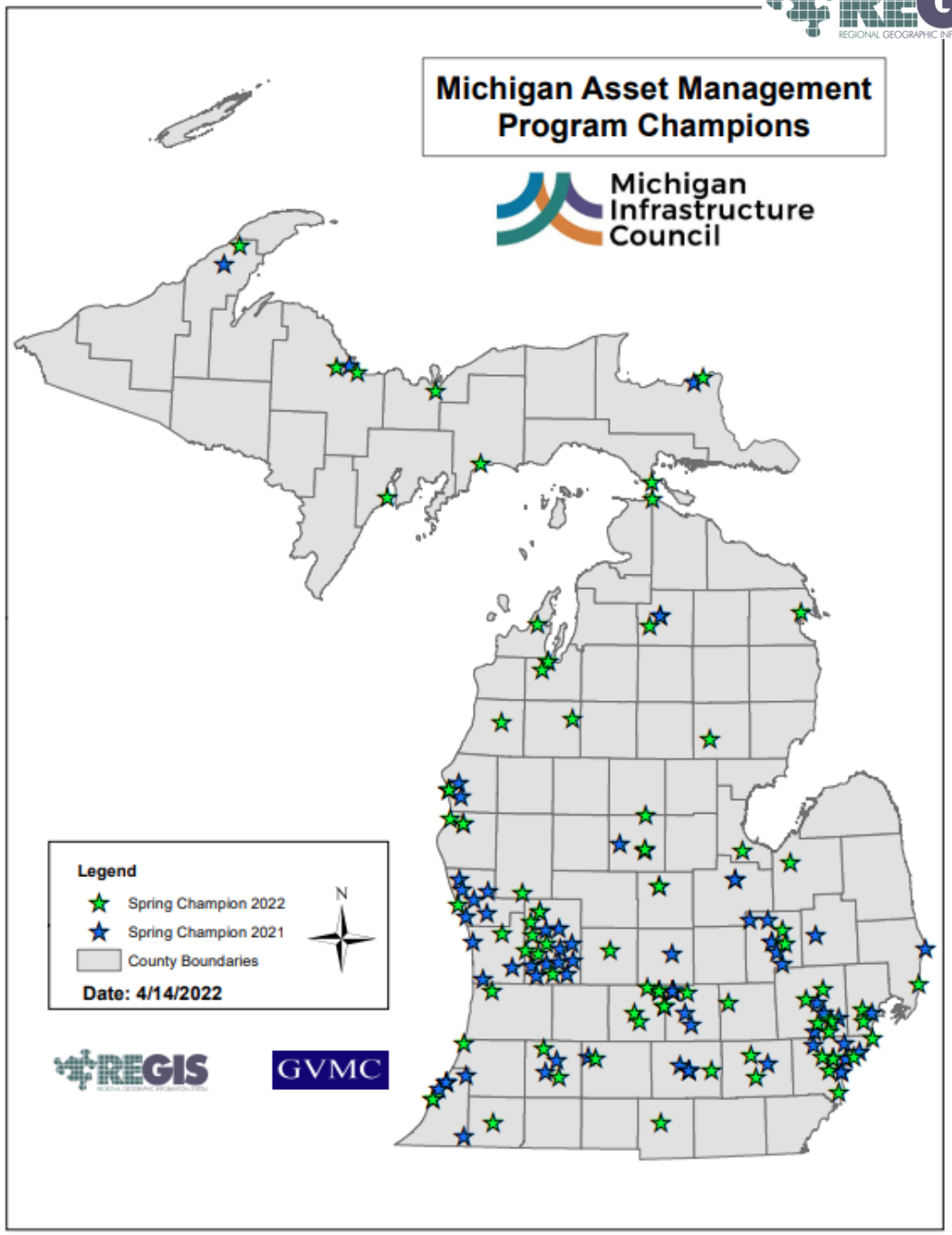
Appointed by the Governor - Term expires 12/31/2024

- Water Asset Management Council (WAMC)
- Transportation Asset Management Council (TAMC)
- Michigan Public Service Commission (MPSC)

Asset Management (AM) Champions

- Establish a network of talented individuals and organizations to help strengthen and “champion” best practice asset management across Michigan’s complex infrastructure environment.

- Local Government Leaders and Infrastructure Staff Received $1,000 Scholarships to Attend Asset Management Champions Program through the MIC.



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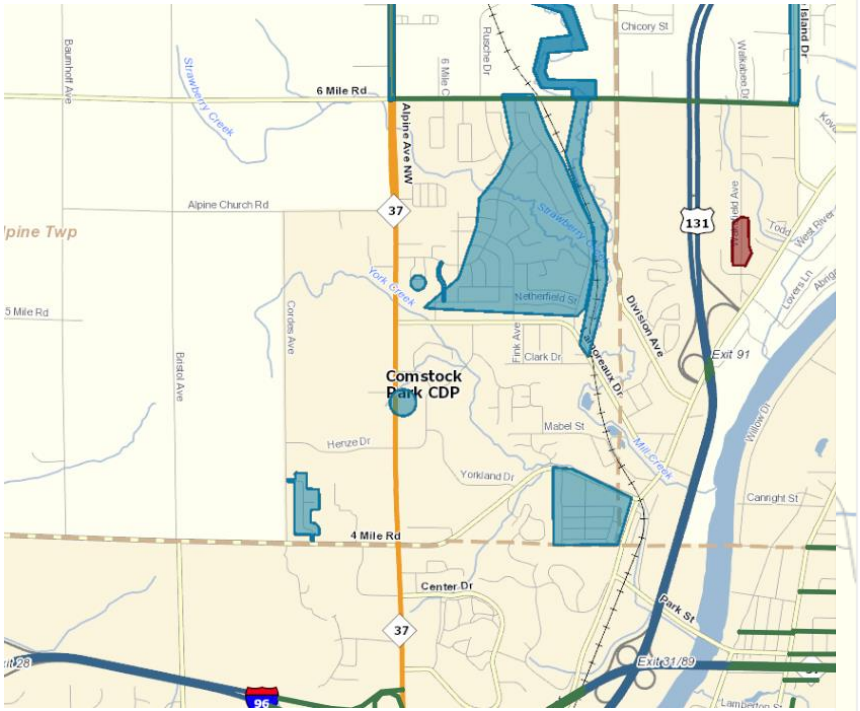
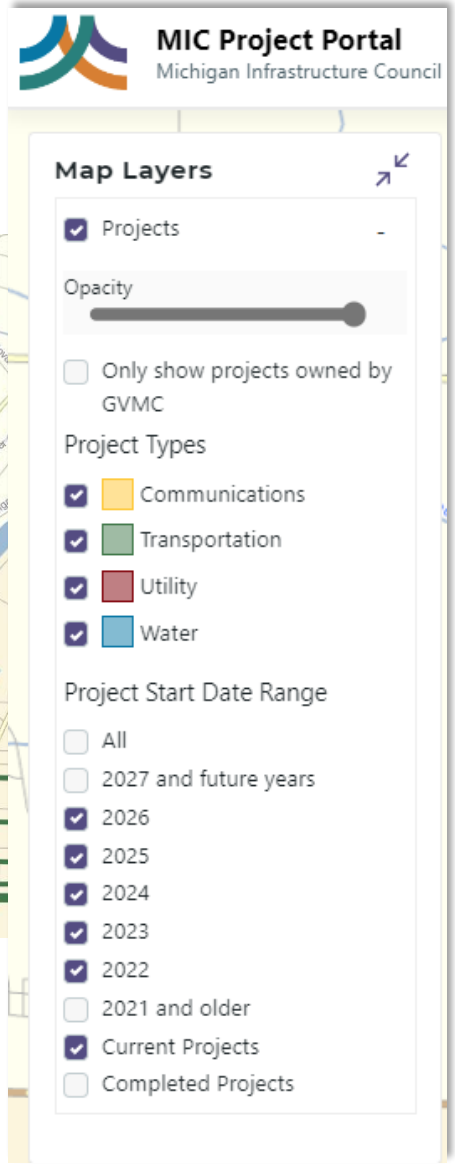
MIC “Dig Once” Project Portal

The Portal allows authorized public and private asset owners to document future construction locations/dates across transportation, water, utilities, and communications infrastructure. Leveraging Geographic Information Systems (GIS) technology, the portal owners of overlapping projects and provides pertinent contact information for collaboration.

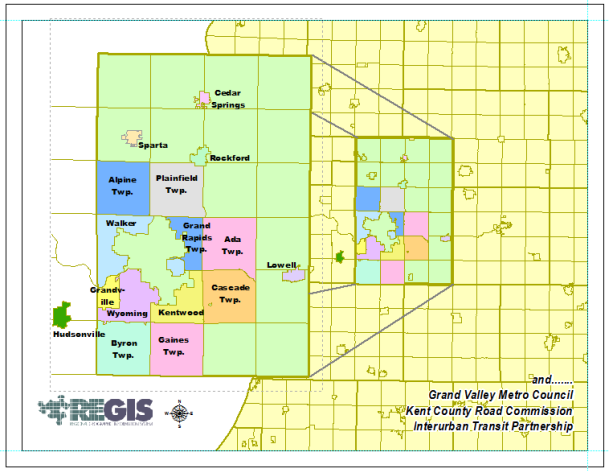




Regional Geographic Information System

- Full GIS Support for:
  - 9 cities and 1 village
  - 7 townships
  - 3 other organizations

  Kent County Road Commission (KCRC), The Rapid & GVMC



- Major Mission:

  Fully Support the activities of REGIS members by providing and maintaining accurate, current and complete geospatial data (over 280 layers of data) and services while seeking partnership and collaboration opportunities across the West Michigan Area

Centralized GIS Department – System of Record

HELP DESK & ON-SITE VISITS

TRAINING PROGRAM

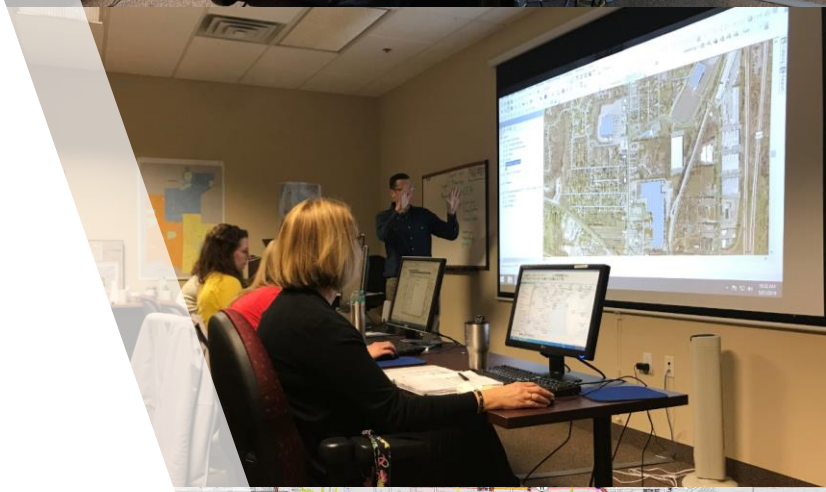
GPS SUPPORT

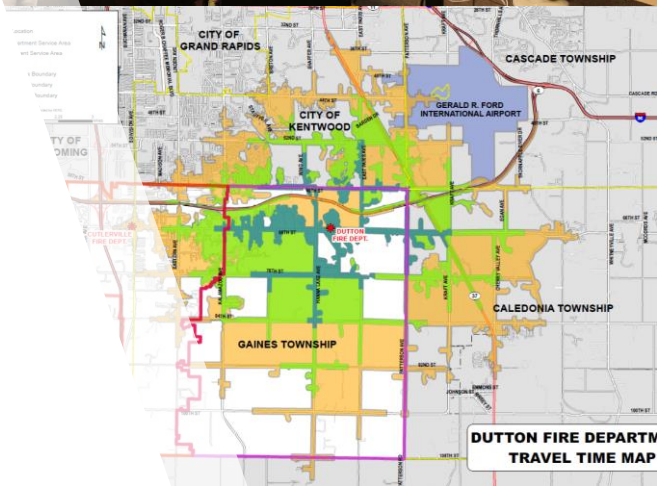
DOCUMENT MANAGEMENT

APPLICATION DEVELOPMENT,

CUSTOM MAPPING &

DATA UPDATES





REGIS Timeline

1997 REGIS Created

- **Agency Bylaws**
  - Defines Organization
- **Memorandum of Understanding**
  - Defines Rules of Engagement
- **Intergovernmental Agreement**
  - Legally Defines Rules

1998-2001 Pilot Phase

- Communities working together as a team
- Ability to share valuable information
- Provide better and more consistent service to our constituents
- Reduce our operating costs
- Make GIS and related technologies commonplace
- Integration with Business Processes
- Provide easy-to-use tools for the end user
- Consolidate Disparate Data Sets

2000s Data Collection/ Conversion

Advisory , subject matter experts

2010s Data Maintenance

2020s

Organization Structure

GVMC Board of Directors

GVMC Executive Committee

REGIS Board
REGIS Executive Committee
(Advisory)

Gayle McCrath-HR
Chris Brown: Finance

GVMC Executive Director
John Weiss

Jason Moore:
Director of GIS Services

Applications-Software : REGIS Staff
Hardware Data Center Mgmt.
REGIS Staff & REGIS Technical Committee

REGIS Collaborations/Partners
REGIS Advisory Group
REGIS Technical Committee

Jing Han: Programmer/
System Administrator

Margaret Chappetta:
GIS Analyst

Steven Musch:
GIS Analyst

Consultants
Avineon
Davey Resource Group
Rehmann

Local Government Service Areas

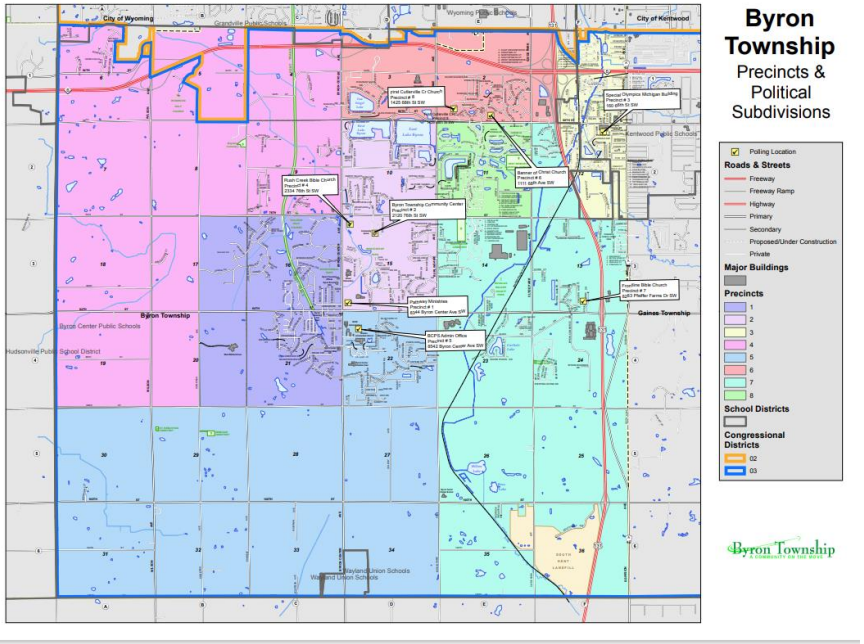
- REGIS Advisory Committee
- Information Technology
- Assessors
- Clerks
- Planning/Zoning
  Community Development
- DPW/Engineers

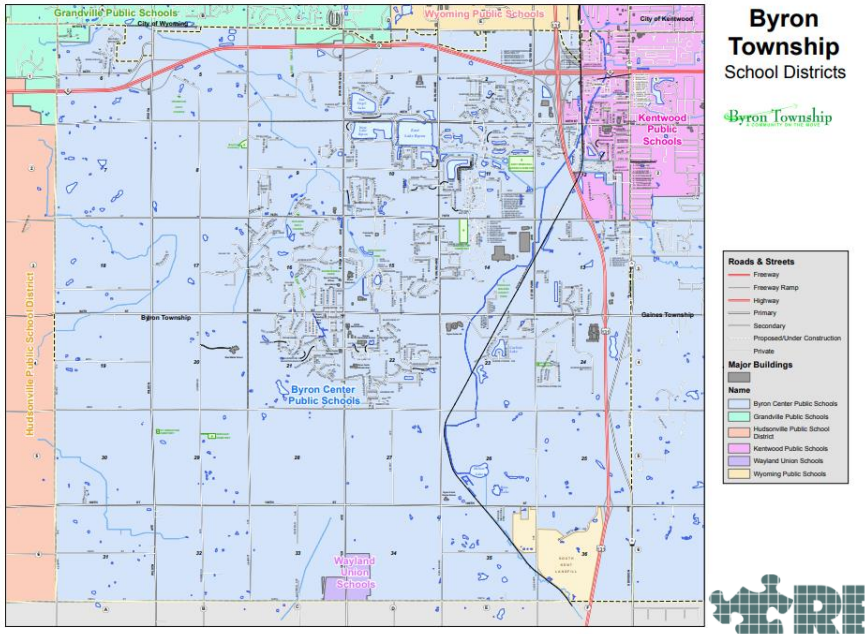
Annual Meetings

- Utilized to generate ideas
- Enhance current GIS tools

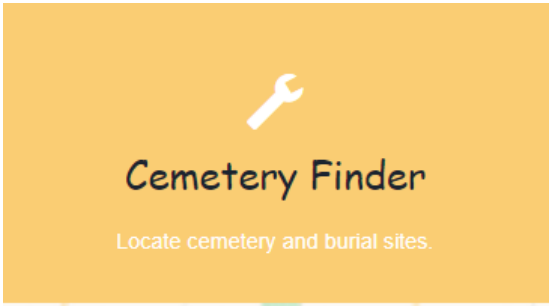
Clerks – Project Examples

- Ward and Precinct Mapping
- Online Precinct Maps – Featured on Mlive
- Redistricting – 2010 & 2020 Census
- Cemetery Mapping & Data Management





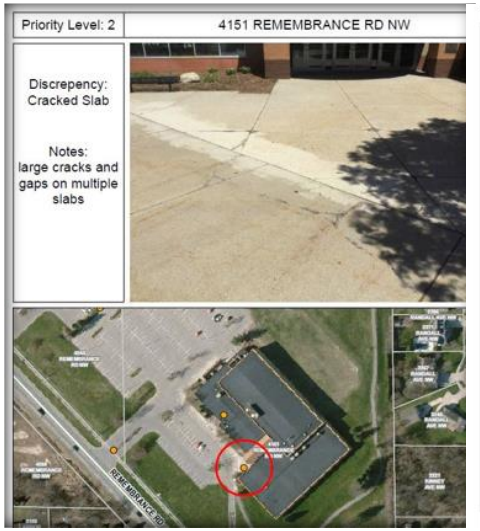
Online Cemetery Maps

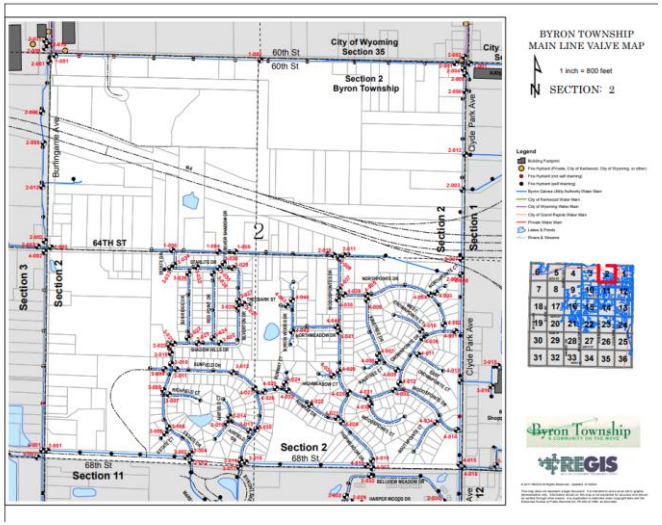


- 25 cemeteries converted to GIS
- 13 communities
- ~115,000 graves digitized

Public Works/ Engineering – Projects

- Capital Improvement Planning
- eREGIS Utility Finder
- Document/Video Management
- Utility System Ratings
- Integrate data with asset management systems





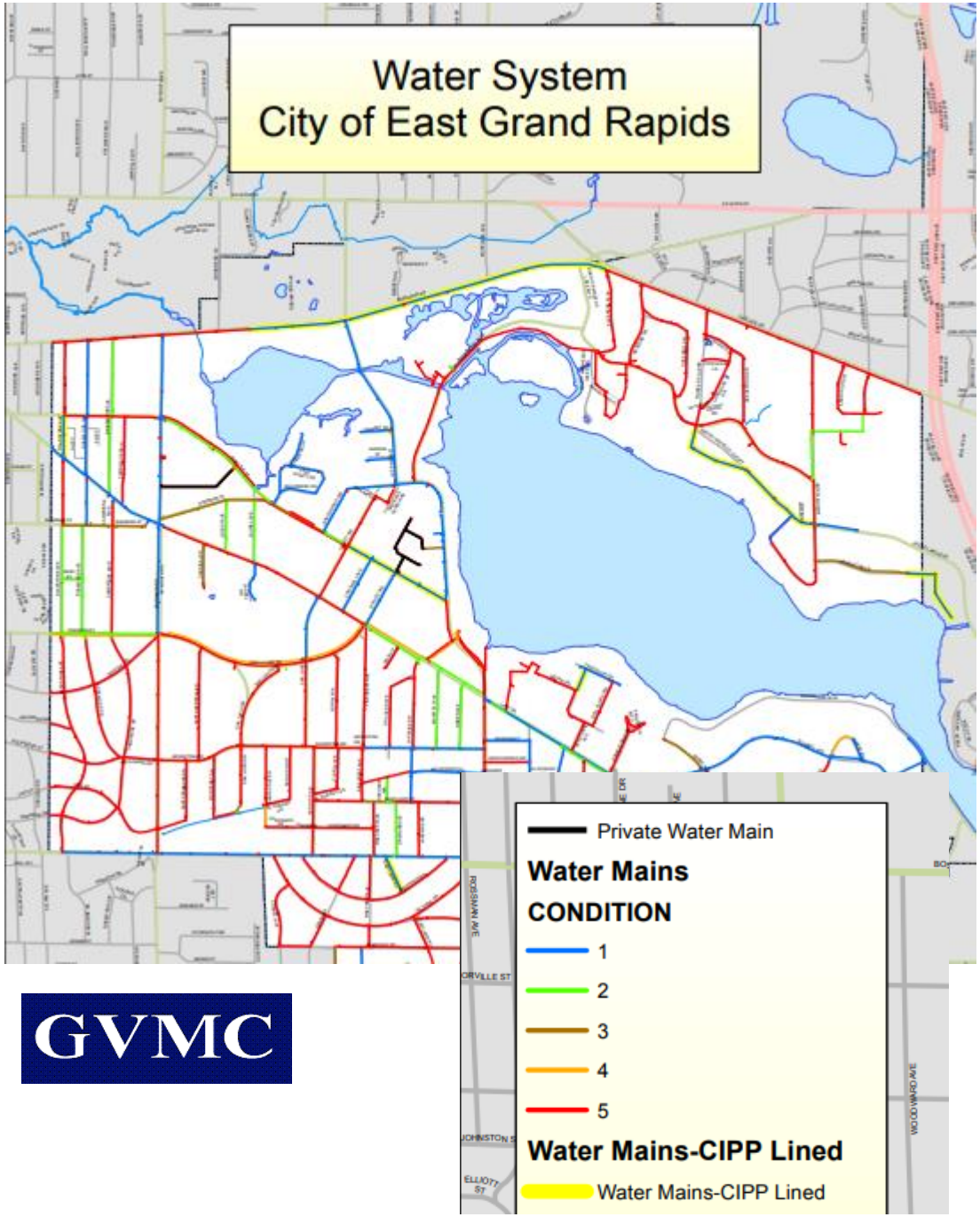
REGIS: an Inventory of Assets

6,295 miles of roads
3,590 miles of non-motorized facilities

2,677 Miles of water main
28,646 fire hydrant locations

2,289 miles of sanitary sewer main
54,149 sanitary manhole locations

1,789 miles of storm sewer main
32,105 storm sewer manholes



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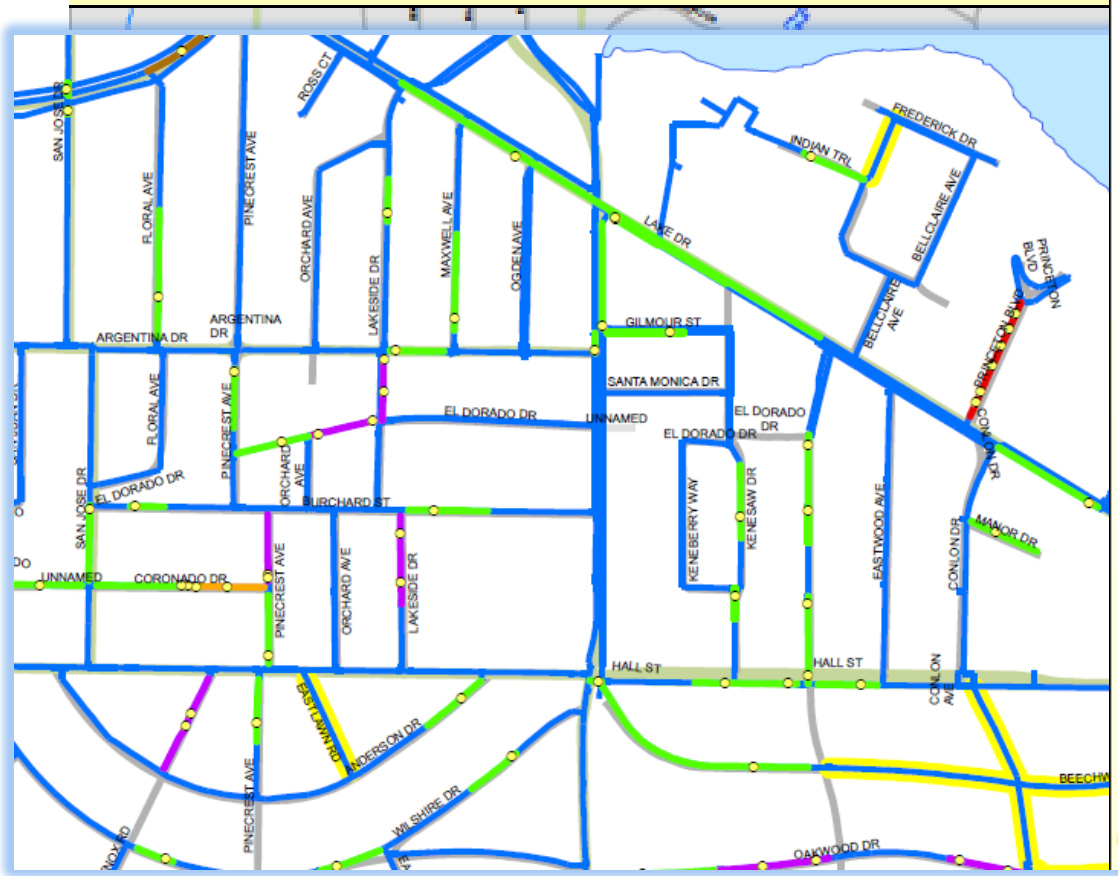
REGIS
REGIONAL GEOGRAPHIC INFORMATION SYSTEM

<u>Used in Decision Making Process</u>

- Using Rating System
- Age of assets (some water & sewer system mains are 79-103 years old in EGR)
- Life Expectancy Chart to plan out replacement of system
- Proactive Approach (rate increase)- if not more water line breaks, sewer line failures, and cost for emergency fixes

Water System
Water Main Break Summary
City of East Grand Rapids



Number of Breaks Per Main

Breaks

- 1
- 2
- 3
- 4
- 6

- Water Main Break Location
- Water Main
- Private Water Main

Water Mains-CIPP Lined

- Water Mains-CIPP Lined

Major Accomplishments since 2015

- Financial Stability: Rebate 6 years = $750,000 back to members

- Sustained system stability with no unplanned down time in since 2015 **This marks 7 years with no unplanned down time

- Major Data Center Hardware and Software Updates in 2015 and 2021-22

- Continued Regional & Statewide Collaboration Efforts in GIS

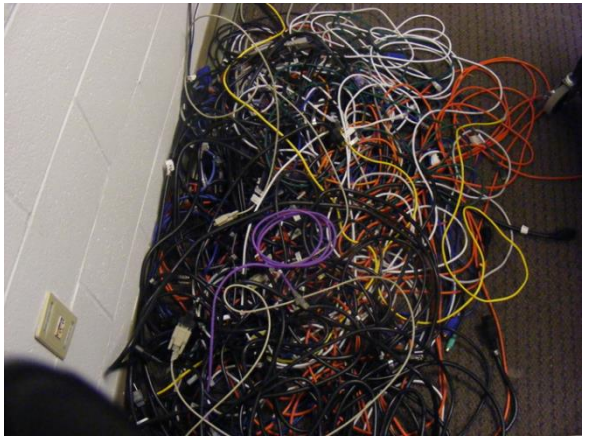
> Presentation at Kent County Association of Assessing Officers (KCAAO) Assessment and Technology seminar

> Leadership role in State-wide asset management pilot project – Data Collection Efforts in West Michigan

>Michigan Infrastructure Commission (MIC) data collection efforts for the "Dig Once Portal". Over 430 projects were submitted on behalf of REGIS Members

>Presentations at Kent County Association of Assessing Officers (KCAAO) , Kent County Clerks Association (KCCA)Engineering Networking Groups Etc.

2015 Data Center Upgrade
Change to Virtual Servers



RESULTS:

- Reduced energy costs by 70%
- Reduced hardware maintenance costs by 35%
- Improved ability to upgrade hardware and software

City of East Grand Rapids –Use Case

WATER + SEWER RATES

KAREN MUSHONG, FINANCE DIRECTOR + DOUG LAFAVE, ASST. CITY MANAGER

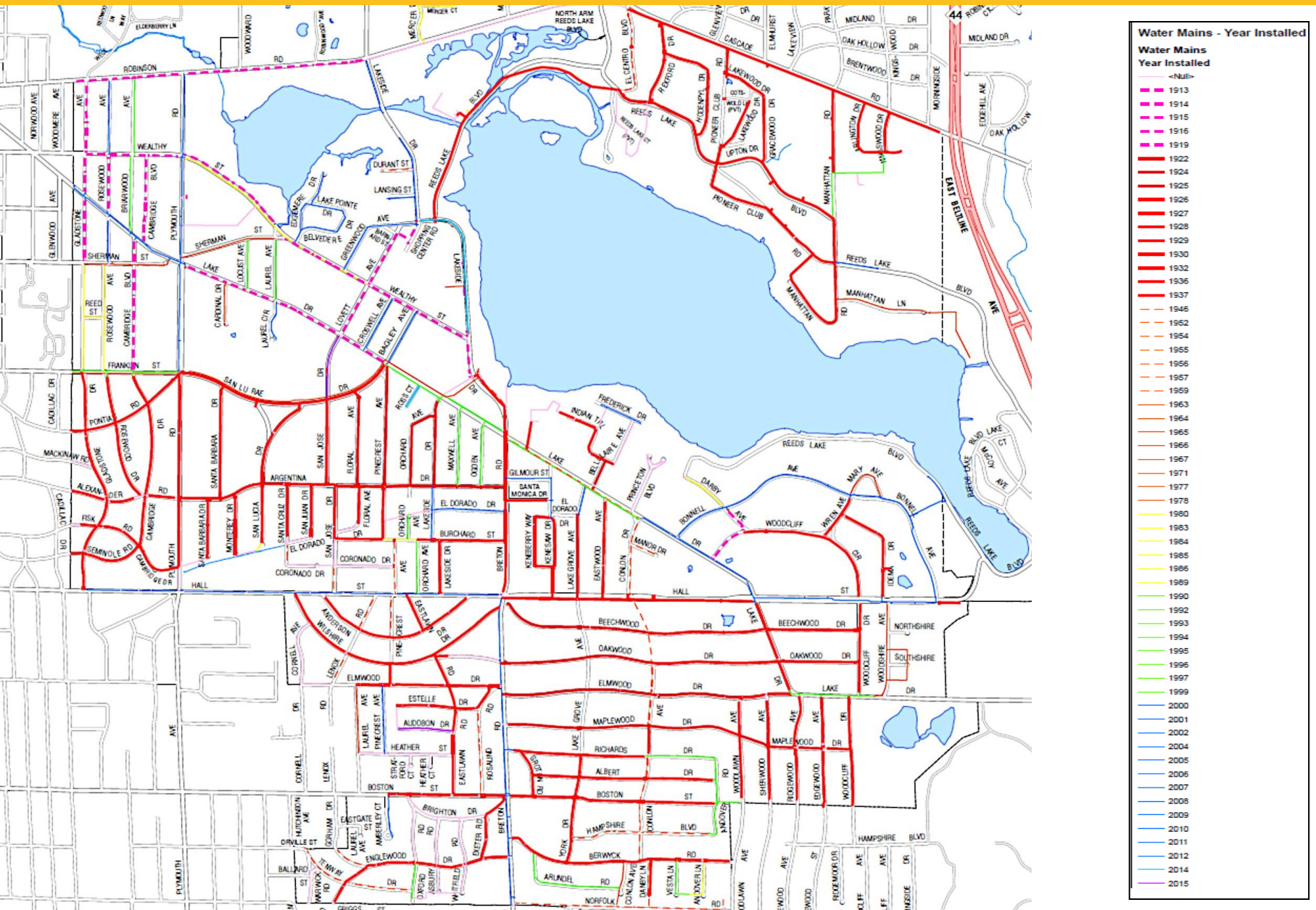
WHAT'S BENEATH OUR ROADS?

CURRENT WATER AND SEWER INFRASTRUCTURE

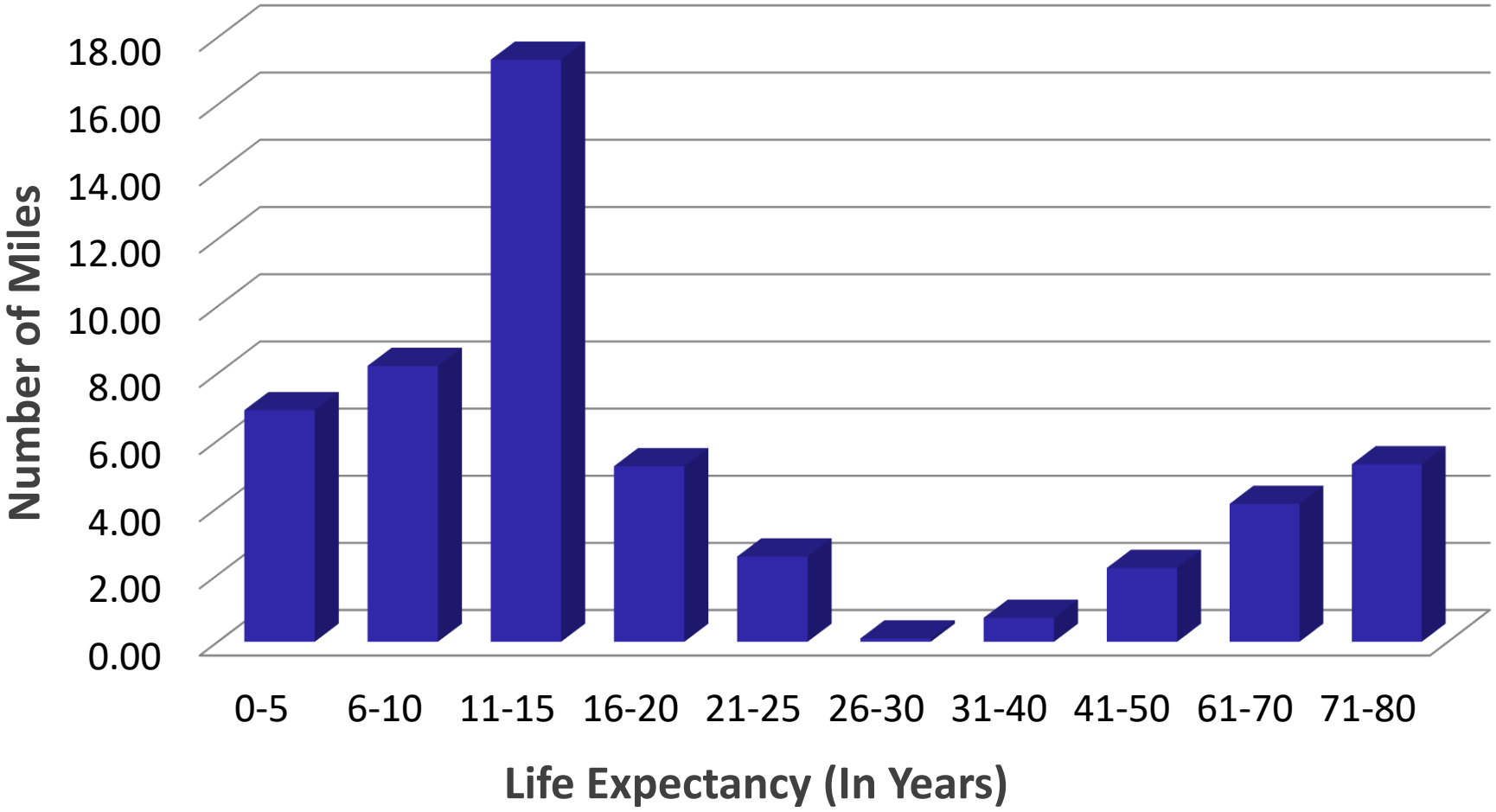
Water utilities must make a substantial reinvestment in infrastructure over the next 30 years. The oldest cast iron pipes, dating to the late 1800s, have an average life expectancy of about 120 years. Because of changing materials and manufacturing techniques, pipes laid in the 1920s have an average life expectancy of about 100 years, and pipes laid in the post-World War II boom can be expected to last about 75 years.

Source: American Water Works Association

AGE OF WATER MAINS

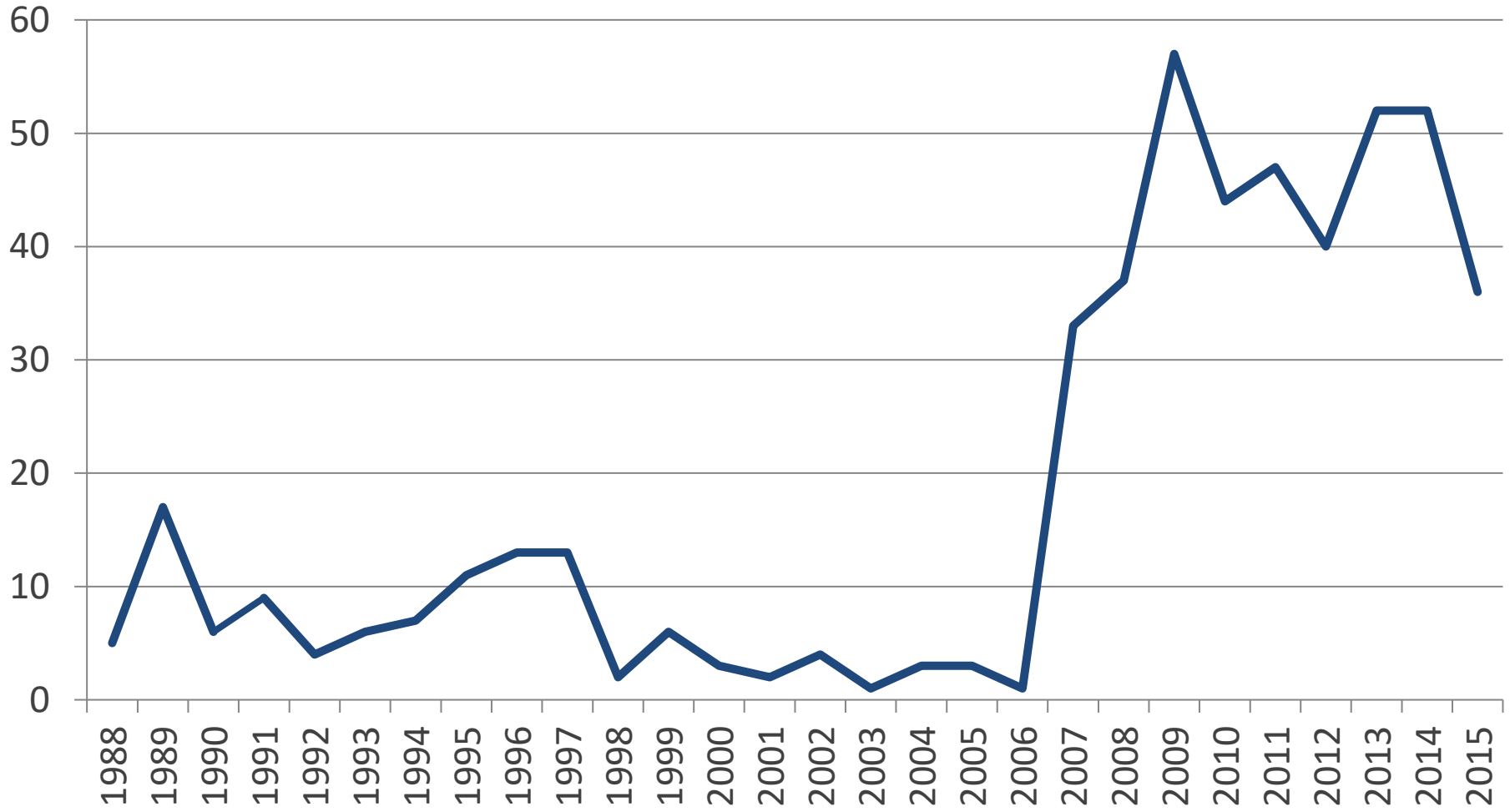


REMAINING LIFE EXPECTANCY OF WATER INFRASTRUCTURE



NUMBER OF WATER SYSTEM REPAIRS BY YEAR

MAINS, SERVICES, HYDRANTS & VALVES



WHAT DOES THIS LOOK LIKE?

61.7%

Fewer than 15 years of service left
(water main only)

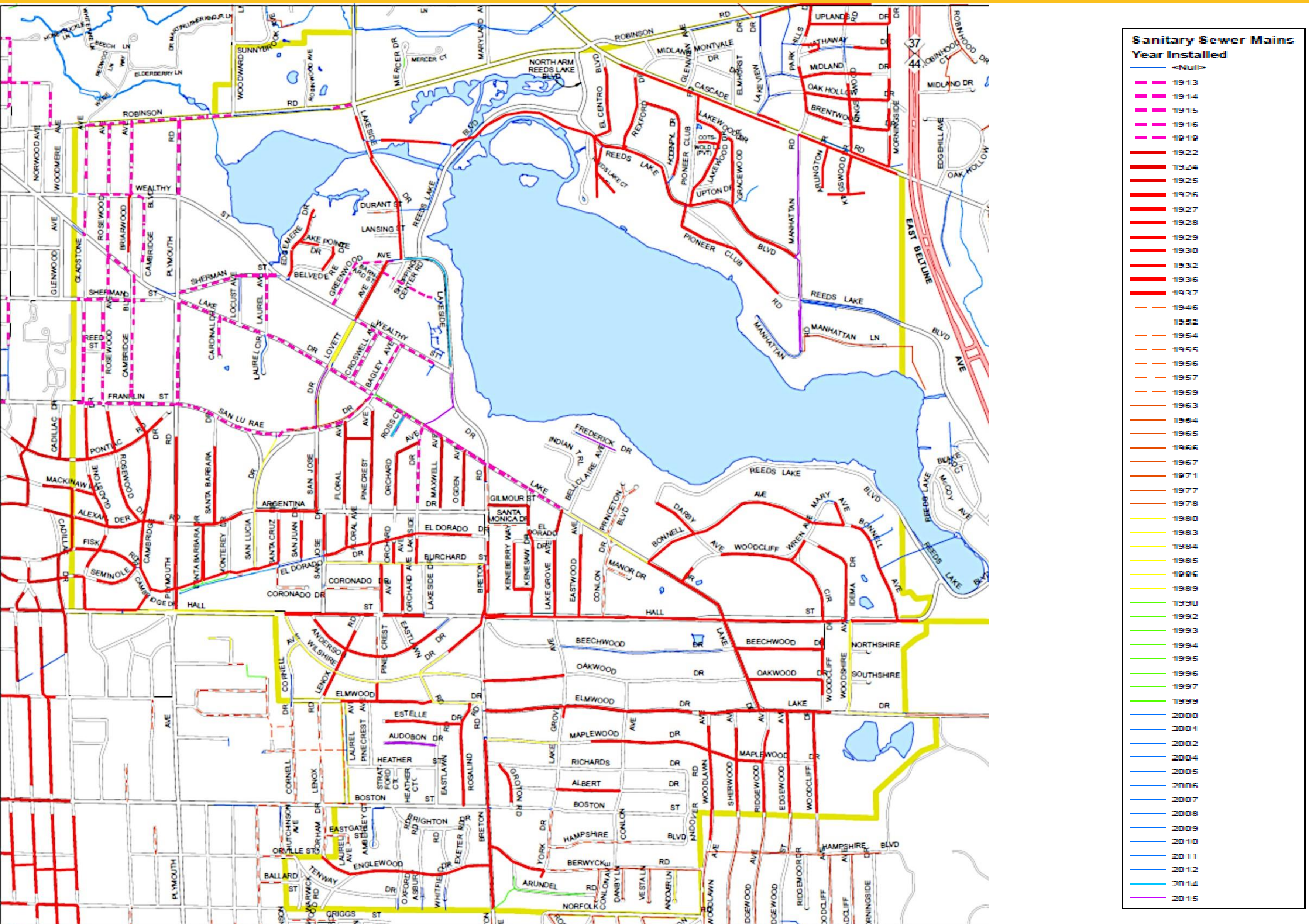
7 Miles

Needs to be replaced in the next 5 years
(water main only)

$900,000

Average amount per mile
(water main only)

AGE OF SANITARY SEWER LINES



AGING SANITARY SEWER LINE

Frederick Drive sanitary sewer that was fractured and collapsing.

AGING SEWER LINE AFTER CURED IN PLACE PIPE LINING

Frederick Drive sanitary sewer after CIPP lining

SANITARY SEWER LIFT STATIONS REPLACEMENT PRIORITY

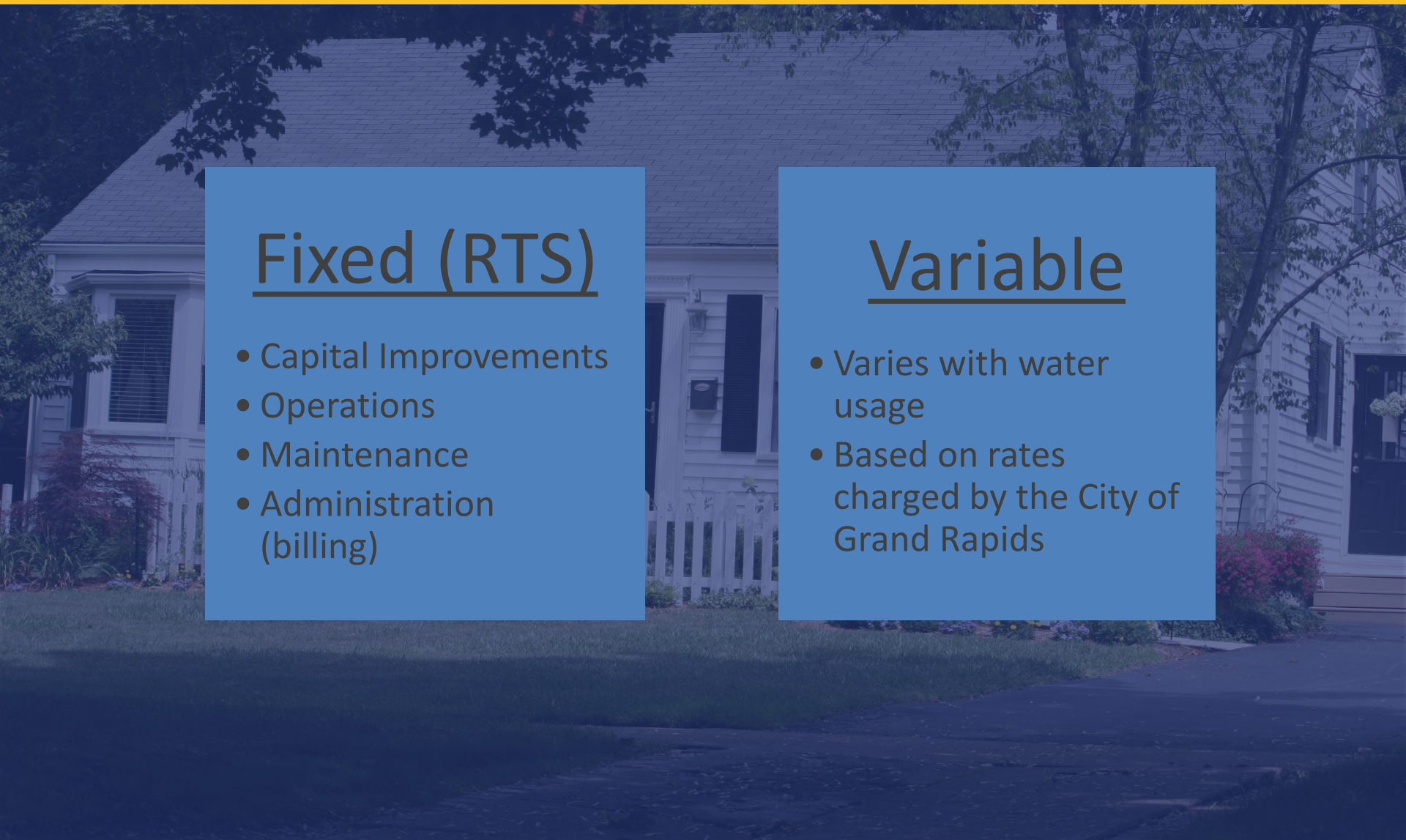
Lift Station	Replacement Date	Age	Updated	Replacement Estimates
Briarwood Lift	2016	1964	-	$160,000
Greenwood Lift	2016-17	1967	-	$350,000
Manhattan Lift	2017-18	1961	-	-
DPW Garage Lift	2018-19	1965	-	-
Kingswood Lift	2019-20	N/A	2003	-
Edgemere Lift	2020-21	1928	2001	-

RATE STUDY GOALS AND OBJECTIVES

Charge what is REQUIRED to operate and maintain the system in good working order by:

- Planning for infrastructure replacements
- Charging stable fees to users
- Equitable cost sharing among users
- Allocation of rates charged by City of Grand Rapids
- Availability of adequate operating cash

UNDERSTANDING THE UTILITY RATE STRUCTURE

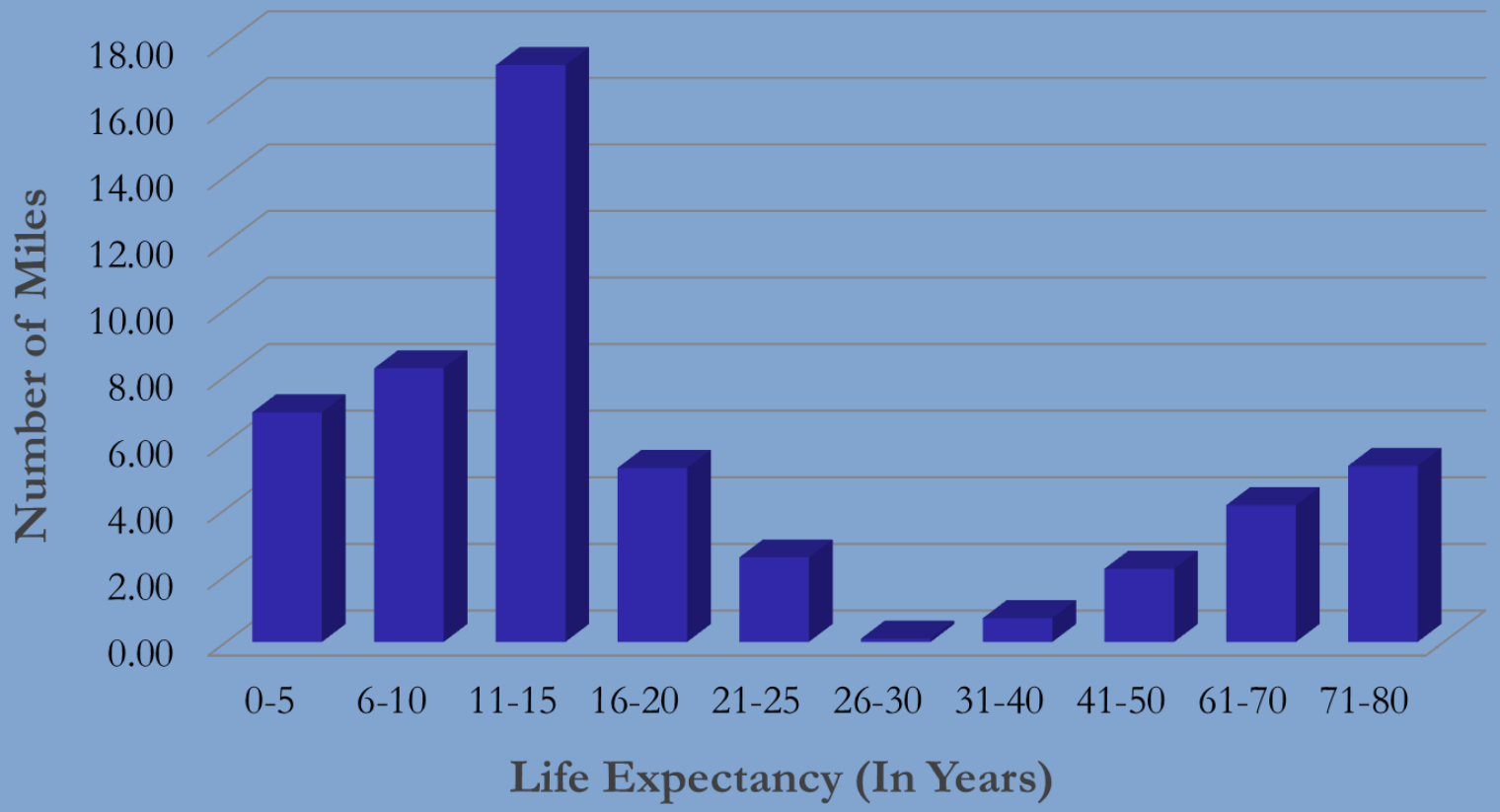


Fixed (RTS)

- Capital Improvements
- Operations
- Maintenance
- Administration (billing)

Variable

- Varies with water usage
- Based on rates charged by the City of Grand Rapids



CAPITAL NEEDS

Current Rates - $600,000 in Capital Projects

Proposed Rates - $1,000,000 in Capital Projects

PROPOSED RATES

The proposed residential **MONTHLY** readiness-to-serve rates and water and sanitary sewer commodity rates

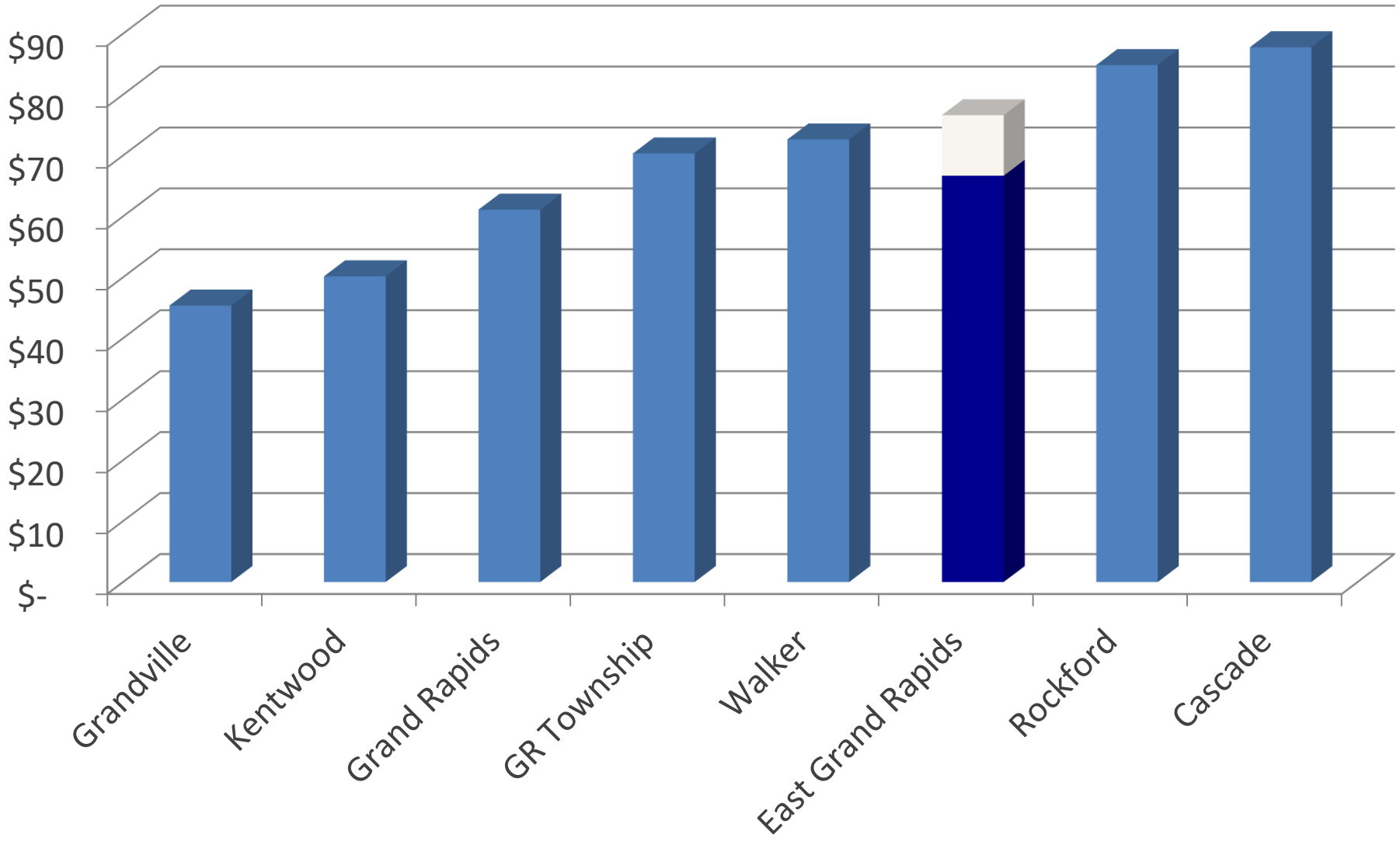
	FY 2015-16 Current	FY 2016-17 Proposed	% Increase
Readiness-to-serve up to 7,000 gallons	**$31.67**	**$36.00**	**14%**
Readiness-to-serve ***(per 1,000 gallons of usage >7,000)***	**$2.50**	**$3.00**	**20%**
Water Commodity ***(per 1,000 gallons)***	**$2.45**	**$2.70**	**10%**
Sanitary Sewer Commodity ***(per 1,000 gallons)***	**$2.55**	**$3.10**	**22%**

EXAMPLE CALCULATION BASED ON AVERAGE USAGE

	Current	Proposed
Water Usage	2.45	2.70
Sanitary Sewer Usage	2.55	3.10
RTS	31.67	36.00
Cost Per Month for 7,000 gallons	66.67	76.60
Percent Increase		15%

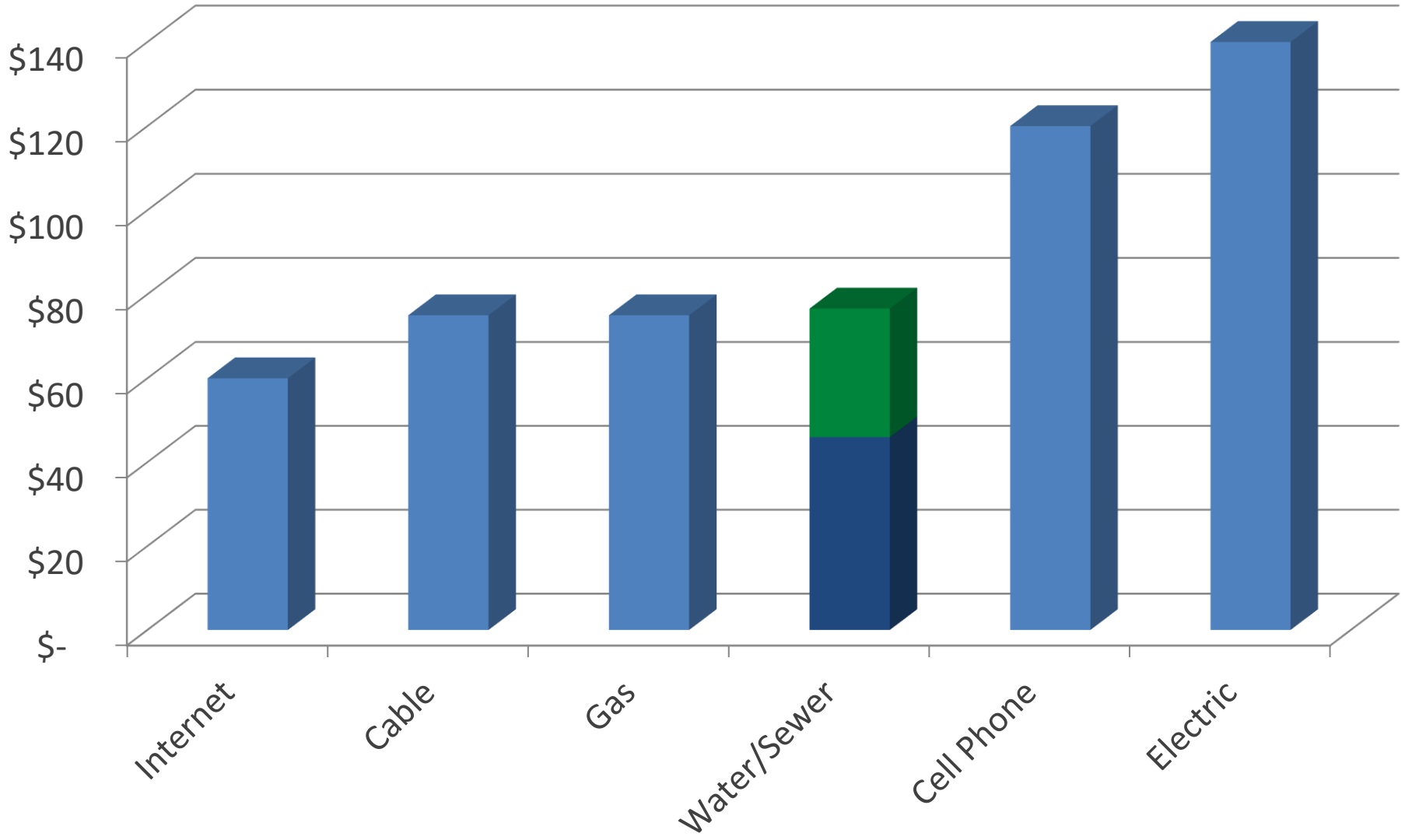
UTILITY RATE COMPARISON

Average Monthly Bill



HOUSEHOLD BILL COMPARISON

Average Monthly Bills - Family



IMPACT OF NO RATE INCREASES

Reduction in planned infrastructure maintenance, repair and replacement could result in:

- More water line breaks
- Sewer line failures
- Unreliable service to residents
- Contractors costs for emergency fixes

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