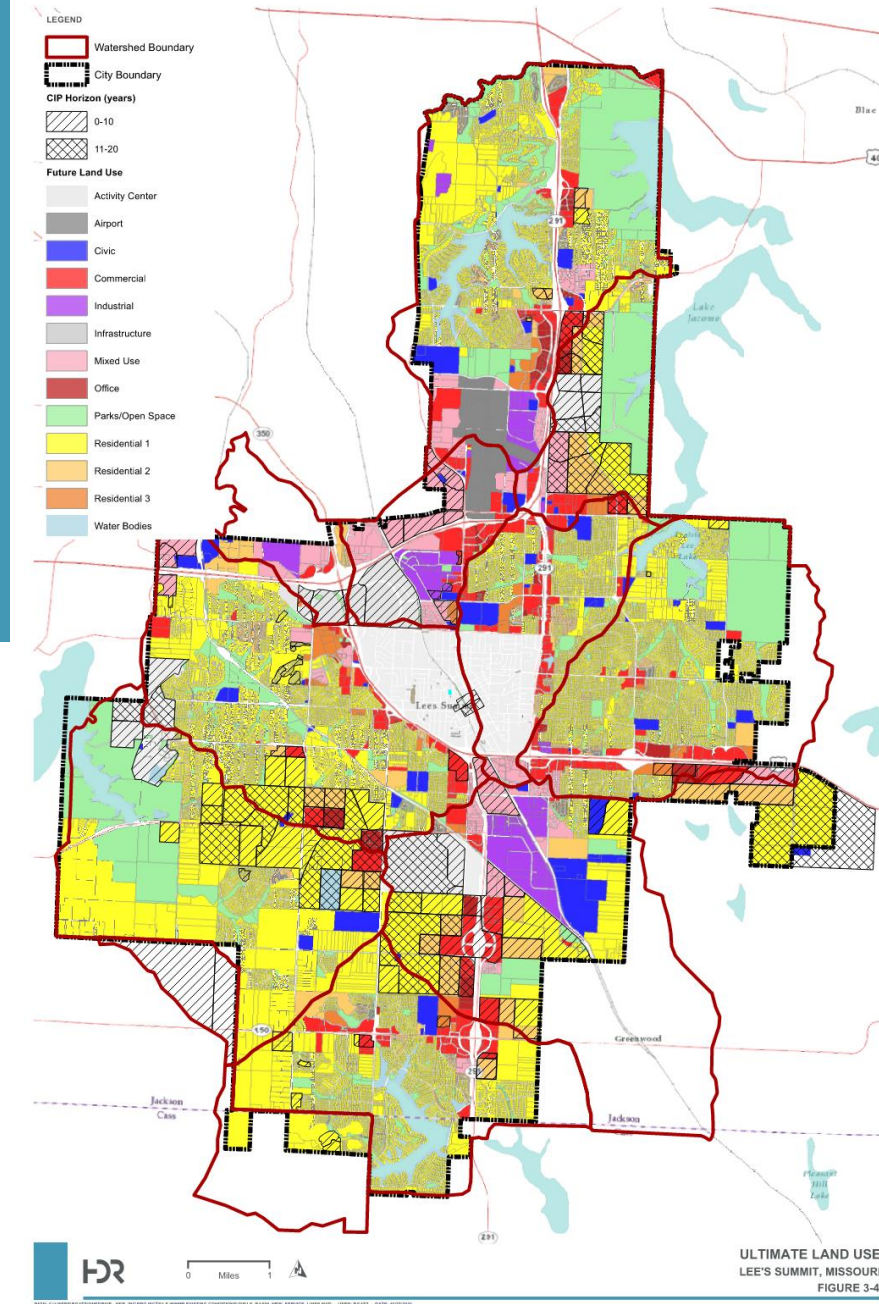


# Waste Water Master Plan

## Planning Commission



05/26/2022



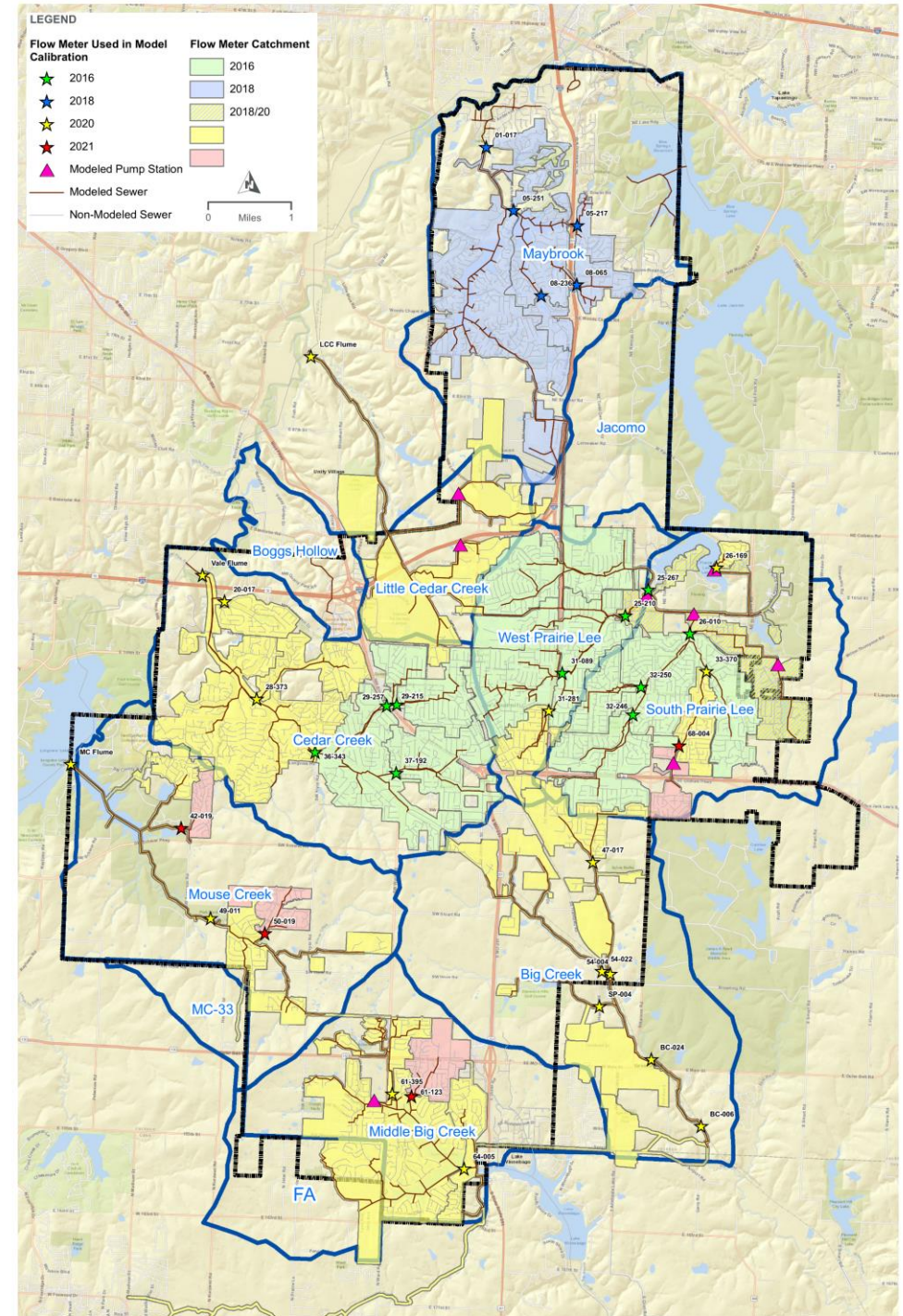
- 01** Planning History & Scope Overview of 2021 Update
- 02** Flow Monitoring
- 03** Growth Projections
- 04** Hydraulic Model
- 05** Design Criteria
- 06** System-wide Condition Assessment
- 07** Capital Improvement Projects

# 01 Planning History & Scope of 2021 Master Plan

- Prior plan completed in 2007
- Scope of 2021 Master Plan Update
  - Flow Monitoring
  - Growth Projections
    - 10 year and 20 year planning periods
  - Hydraulic Modeling of Collection System
    - Scenarios: Existing Dry Weather, Existing Wet Weather, 10-yr Development, 20-yr Development
  - Design Criteria Review
  - System-wide Condition Assessment (renewal model)
  - Capital Improvements Projects

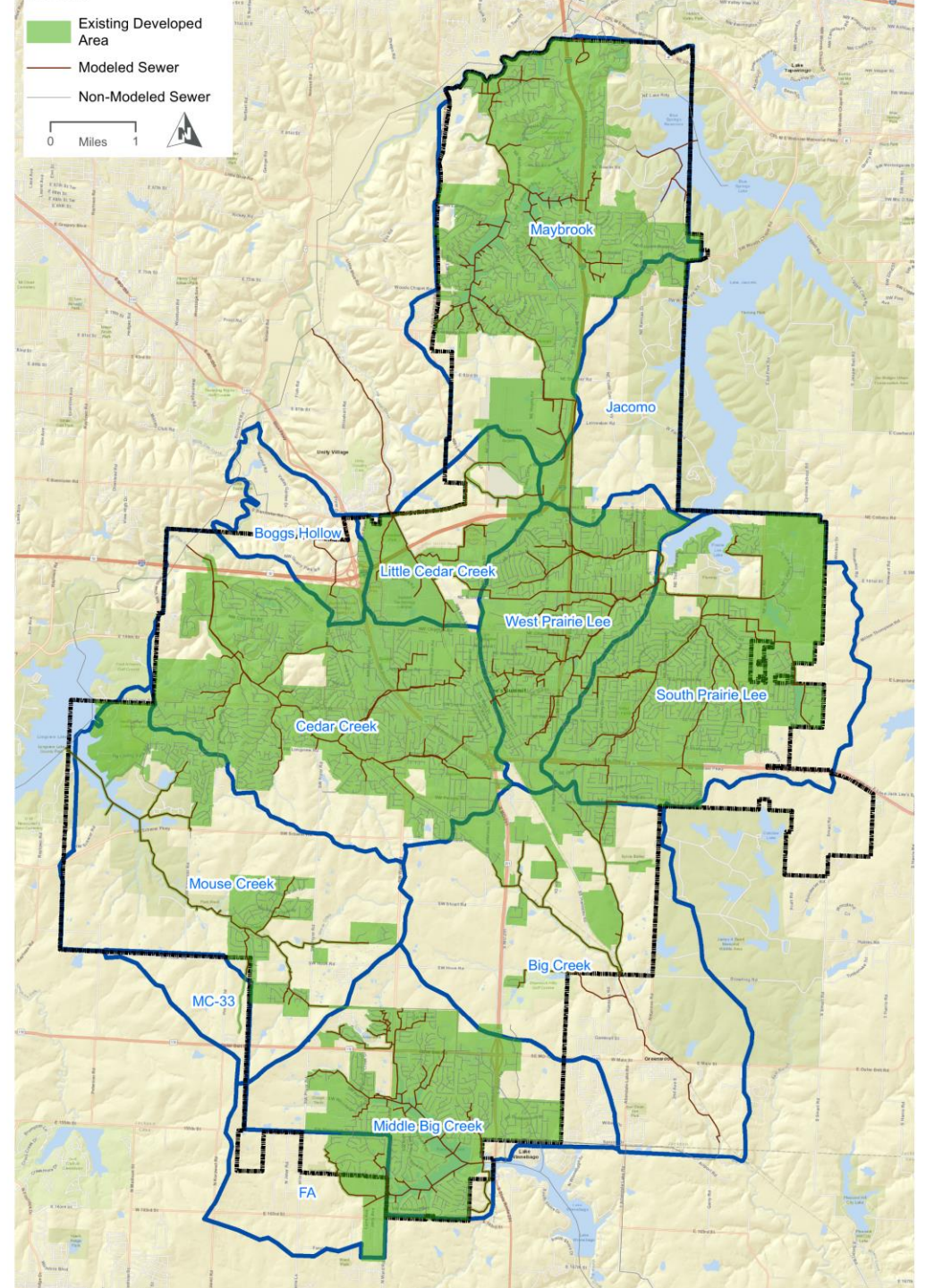
# 02 Flow Monitoring of Existing System

Watershed	Quantity of Meters			
	2016	2018	2020	2021
Big Creek			6	
Cedar Creek	4		3	
Little Cedar Creek			1	
Maybrook		5		
Middle Big Creek			2	1
Mouse Creek			2	2
South Prairie Lee	3		2	1
West Prairie Lee	3		1	
<b>TOTAL</b>		<b>36</b>		



# 03 Growth Projections

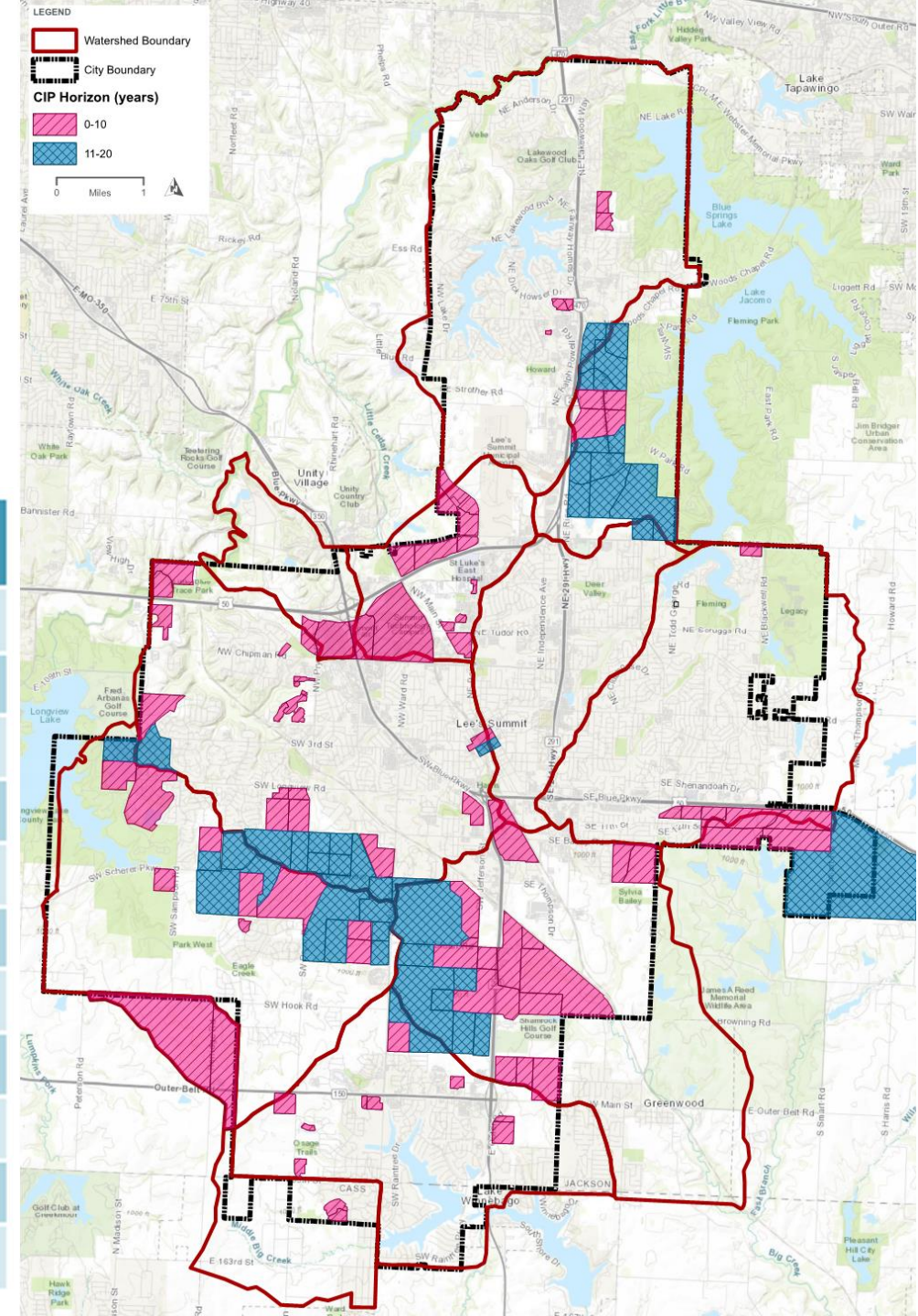
- Existing developed areas



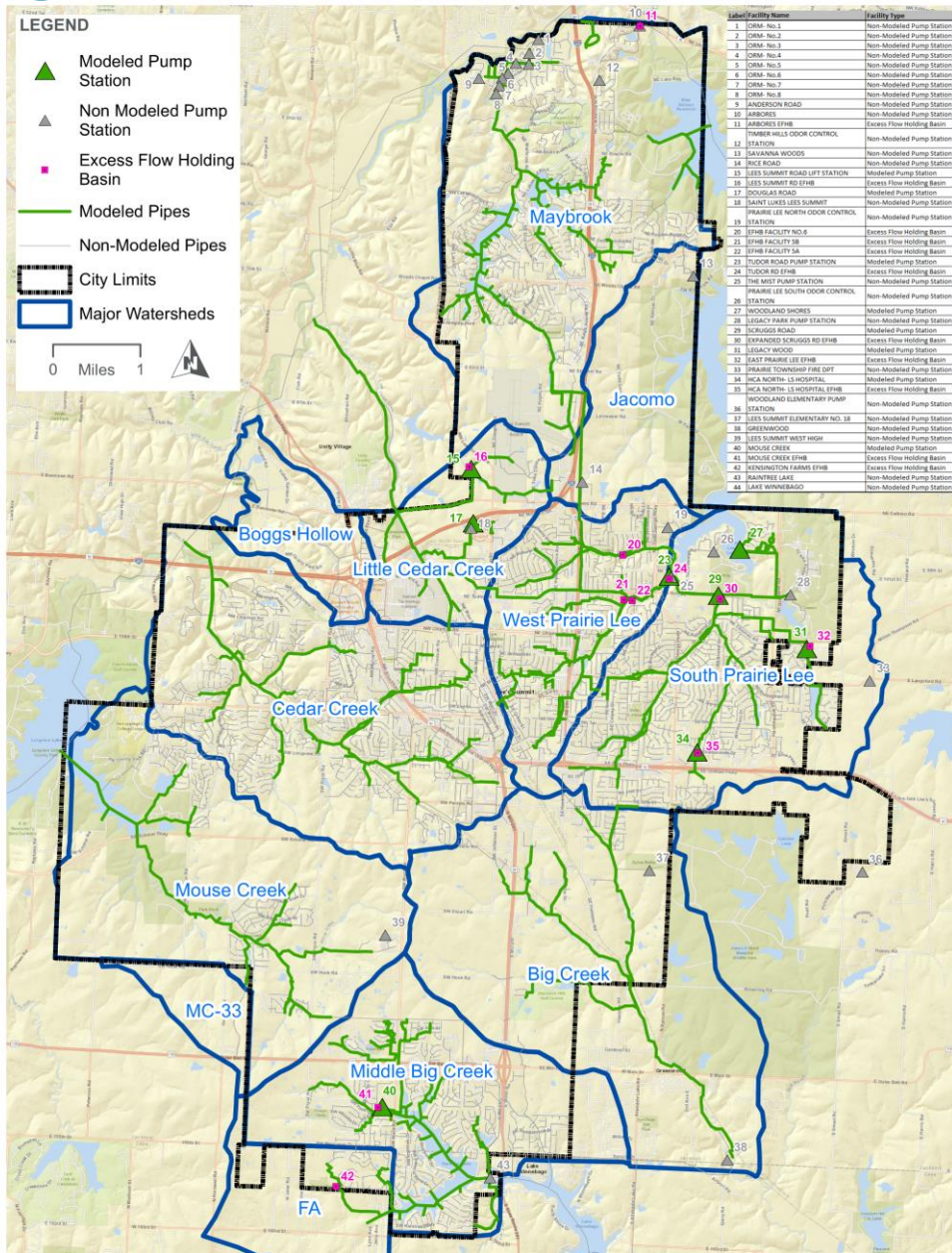
# 03 Growth Projections

- 10-year: 4,590 acres
- 20-year: 4,158 acres

Watersheds	Residential Acreage			Non-Residential Acreage*			Grand Total (Acres)
	0-10 Yr CIP	11-20 Yr CIP	Total	0-10 Yr CIP	11-20 Yr CIP	Total	
Big Creek	684	850	1,534	693	56	749	2,283
Cedar Creek	273	351	624	345	175	520	1,144
Jacomo	118	287	405	72	622	694	1,099
Little Cedar Creek	--	--	--	477	--	477	477
Maybrook	22	--	22	42	--	42	64
Middle Big Creek	162	96	258	15	--	15	273
Mouse Creek	1,159	767	1,926	18	80	98	2,024
South Prairie Lee	272	874	1,146	217	--	217	1,363
West Prairie Lee	--	--	--	21	--	21	21
<b>Grand Total</b>	<b>2,690</b>	<b>3,225</b>	<b>5,915</b>	<b>1,900</b>	<b>933</b>	<b>2,833</b>	<b>8,748</b>



# 04 Hydraulic Model

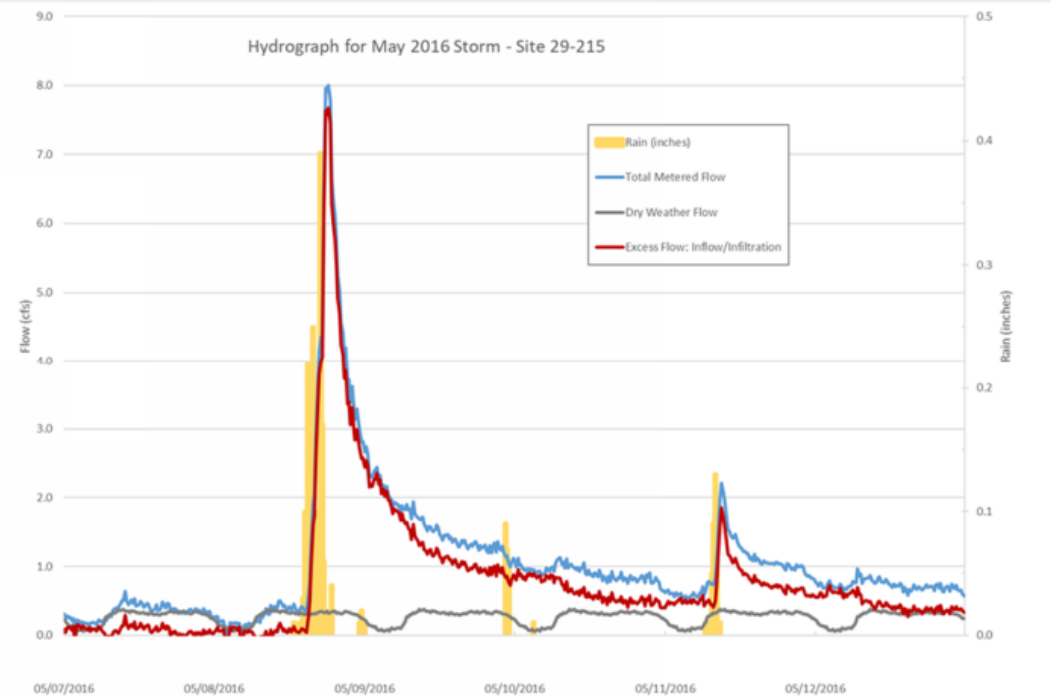
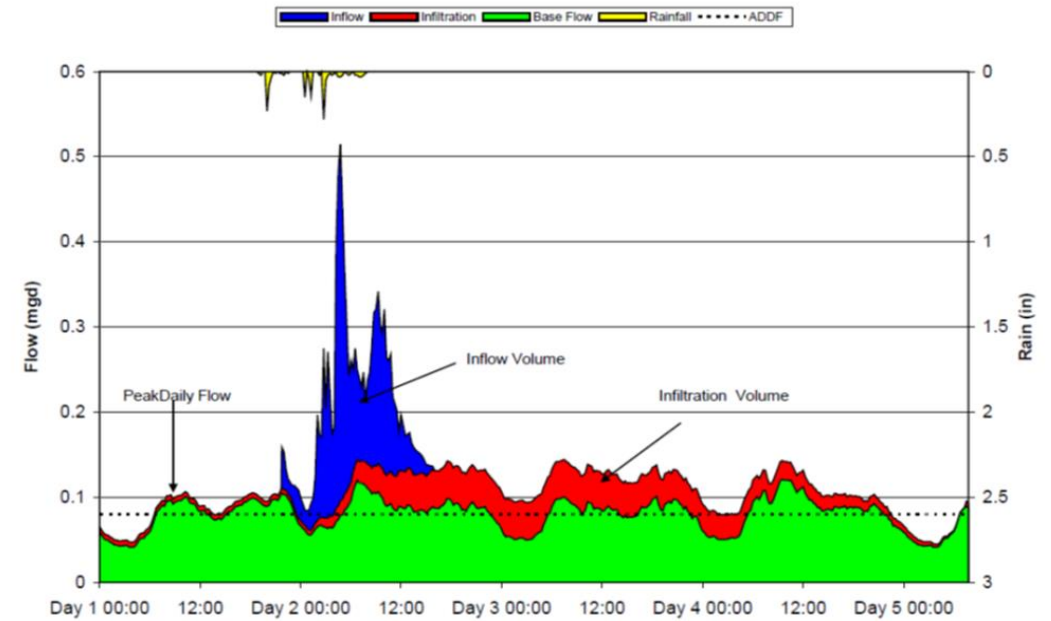


- Model built from GIS mapping and system verifications
- Broken out by watershed
- Utilize City's GIS
  - Updated by survey in select spots
- Modeled lines 10" in diameter and greater

# 04 Hydraulic Model

## Existing Dry Weather, Existing Wet Weather

- Calibrate model to existing flow monitoring results
- Predict collection system response to wet weather

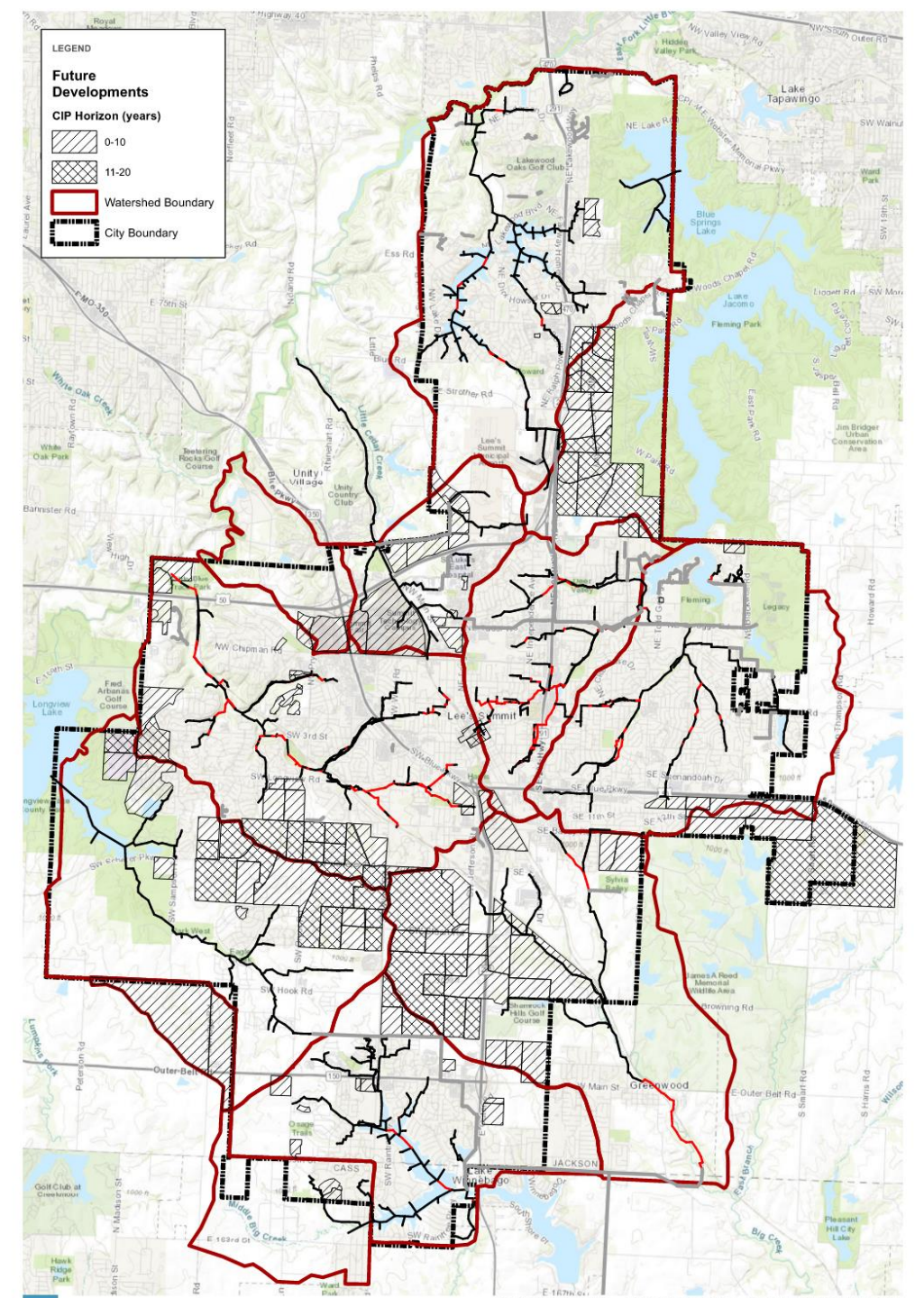




# 04 Hydraulic Model

## Results – Existing Wet Weather

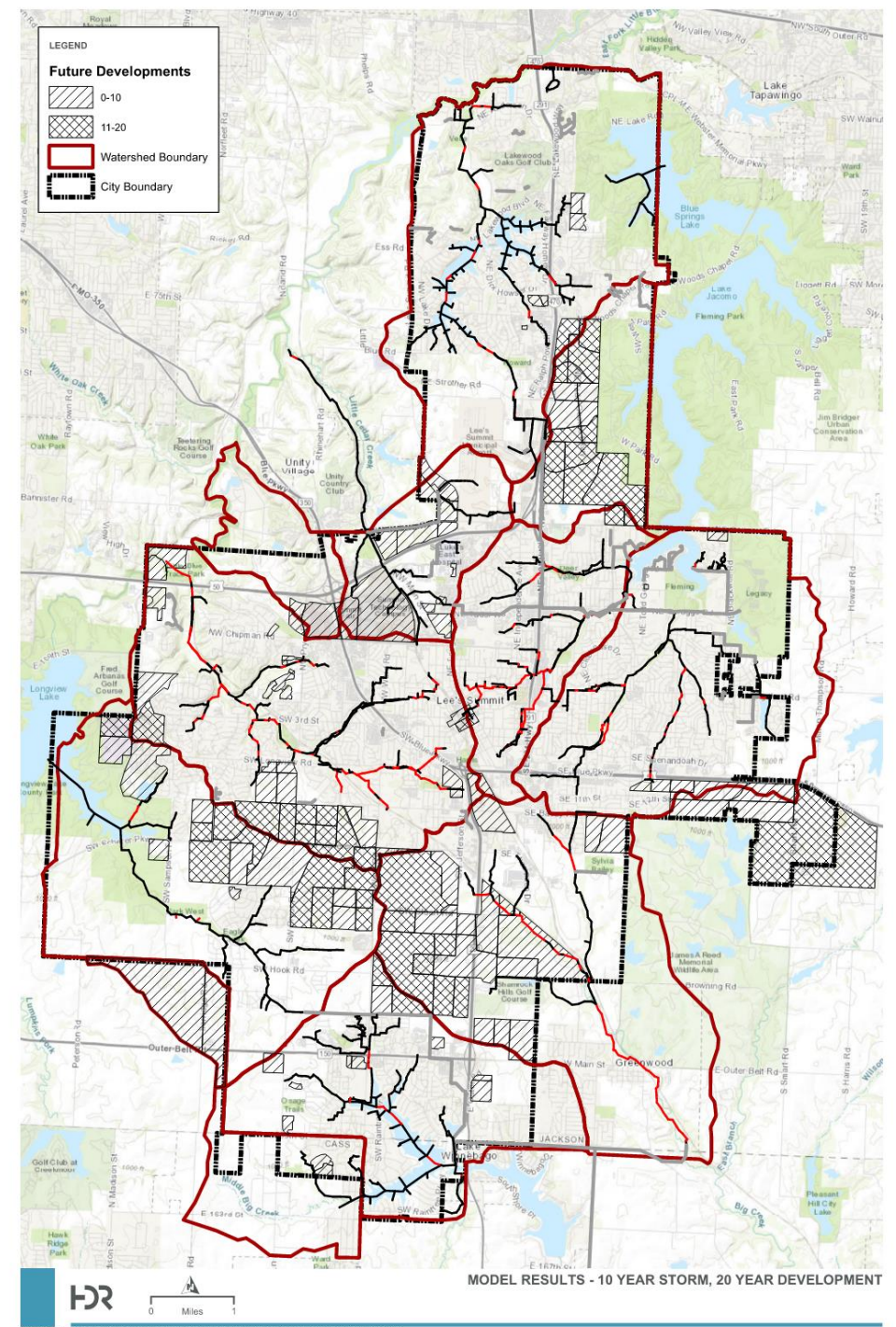
- Review capacity on watershed level



# 04 Hydraulic Model

## Results for 20 year Development Scenario

- Predict collection system response after 20-year development



# 05 Design Criteria

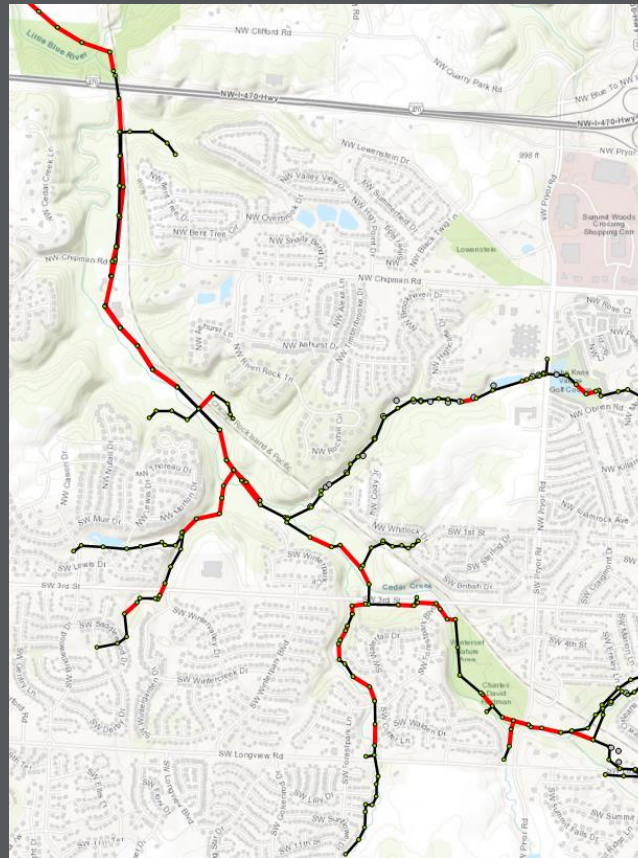
## Current Planning Criteria – Regional Comparison

- Lee's Summit - 2020
  - Design Storm = 50-Year
  - Results in Peaking Factor of approximately 15:1, depending on size of area
- JCW
  - Design Storm = 10-yr
  - Model parameters results in peaking factor of approximately 6 to 7:1 on 10-year storm, depending on size of area
- UG
  - Design Storm = 5-yr (western part of service area)
  - $K=0.004$
  - Peaking factor equates to approximately 5 to 6:1 peak for the 5-year storm, depending on size of area

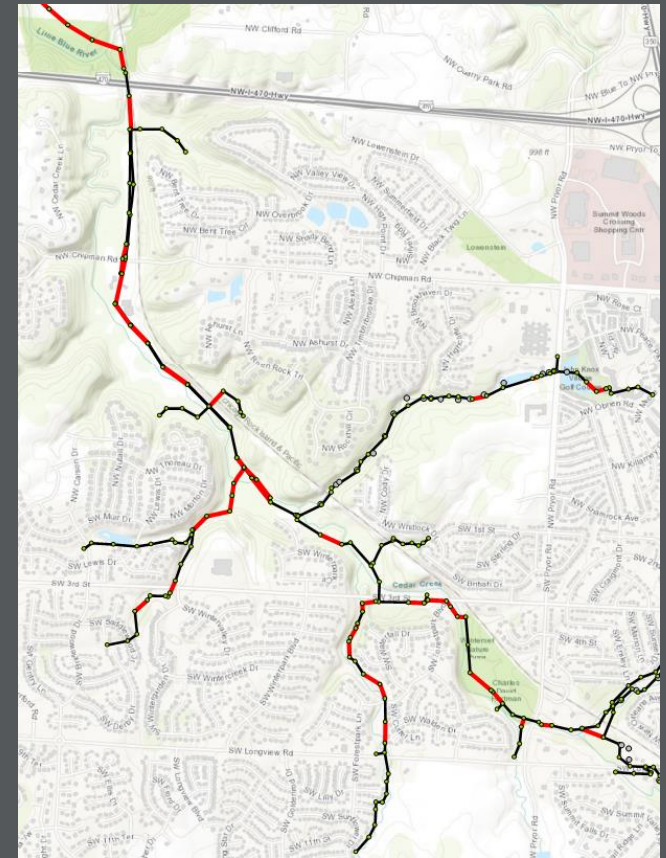
# 05 Design Criteria

## Impacts on Revision

- Utilize reserve capacity in existing collection system
- Optimize Tudor Road Pump Station operation
  - Maximize capacity in interceptors beneath Lakewood Lakes



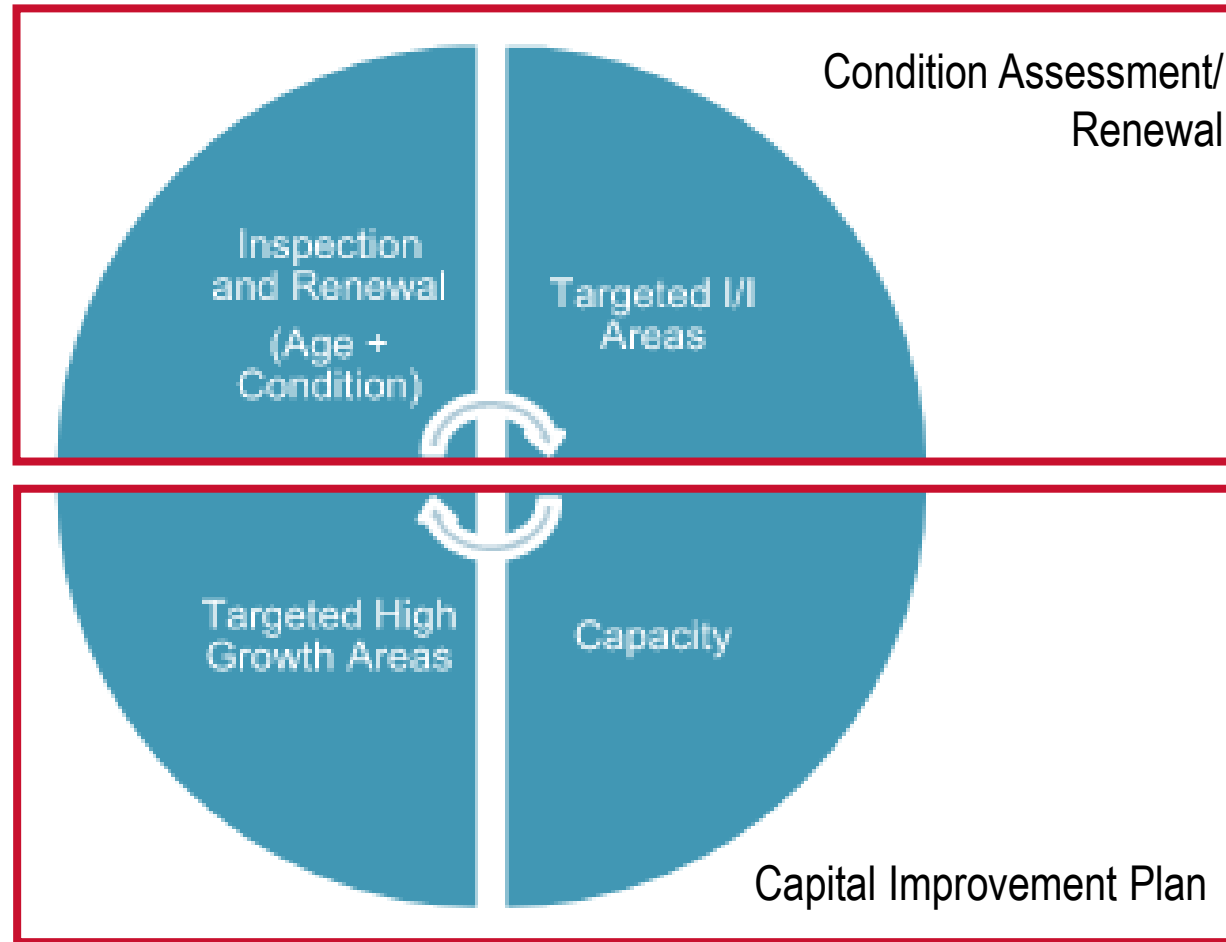
50-year Design Storm



10-year Design Storm

# 06 System-wide Condition Assessment

- Renewal Planning for infrastructure as it reaches end of useful life
- Project 20-year needs that would not be addressed by other CIP activities



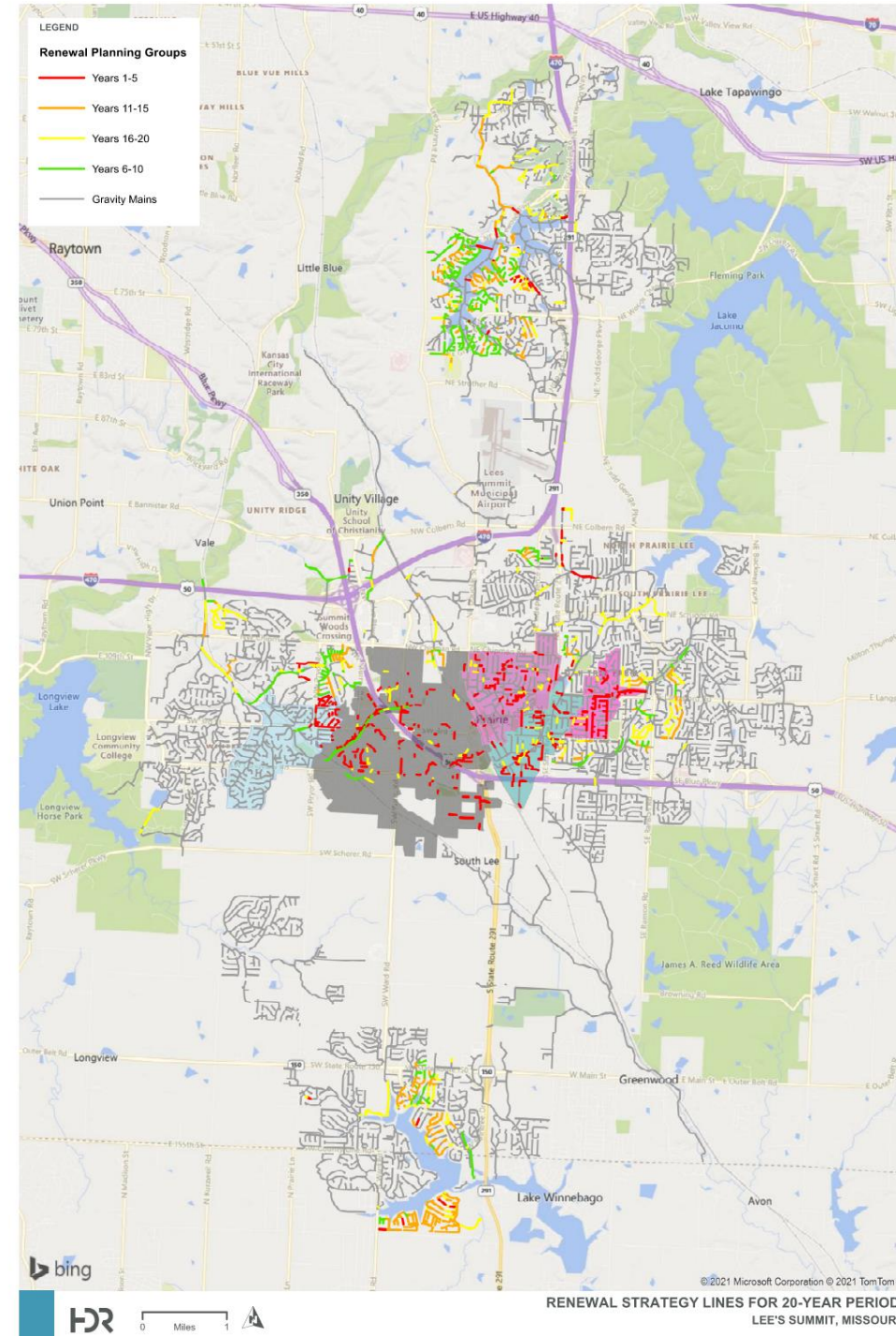
# 06 System-wide Condition Assessment

- Renewal Plan

Table 6-14: Inspection and Renewal 20-Year Planning Period Estimates

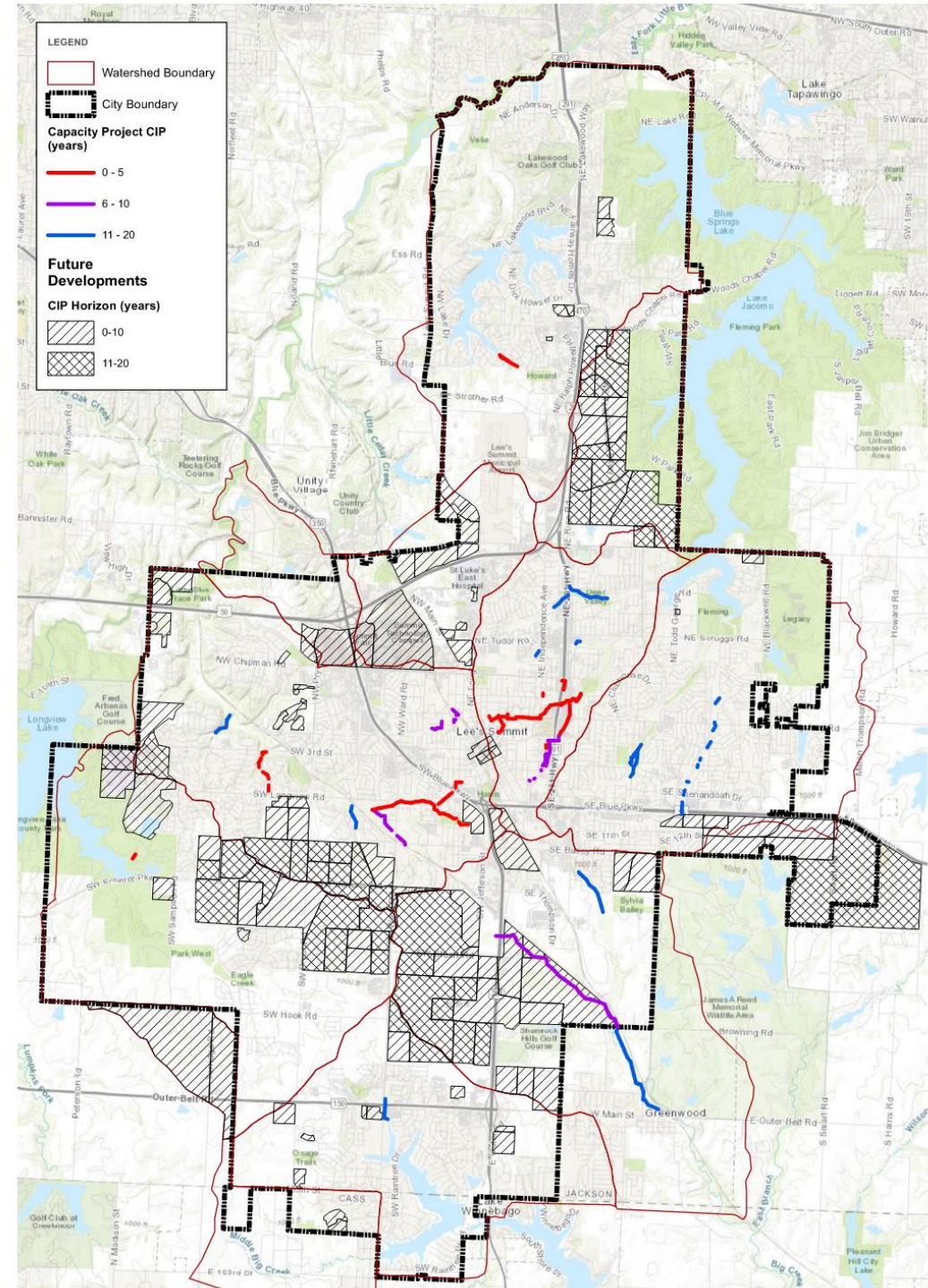
Planning Years	Total Miles	Estimated Renewal Cost	Estimated Inspection Costs	Contingency (30%)	Total Planning Period Costs
1-5 Years	18	\$3,346,900	\$163,705	\$1,053,180	\$4,563,780
6-10 Years	18	\$2,749,600	\$160,886	\$873,150	\$3,783,650
11-15 Years	18	\$3,571,700	\$180,881	\$1,125,780	\$4,878,380
16-20 Year	18	\$4,799,600	\$219,802	\$1,505,820	\$6,525,220
<b>Total (20 Yrs.)</b>	<b>72</b>	<b>\$14,467,800</b>	<b>\$725,274</b>	<b>\$4,557,930</b>	<b>\$19,751,030</b>

- Renewal budget ~\$1M /yr (2021\$) keeps pace with system renewal



# 07 Capital Improvement Projects

- 20-year CIP
  - \$62M in potential projects
  - Projects include Tap and User Funds
  - Projects include:
    - System Upsizing/Expansion
    - System Renewal / I&I Removal



**Questions?**