JOPLIN CITY COUNCIL

WORK SESSION
5:45 P.M.
MONDAY, OCTOBER 12, 2020
JOPLIN CITY HALL
5th FLOOR COUNCIL CHAMBERS
602 S. MAIN STREET
JOPLIN, MISSOURI

Notice is hereby given that the City Council of the City of Joplin, Missouri, will conduct a Work Session at 5:45 p.m. on Monday, October 12, 2020 at Joplin City Hall, 5th Floor Council Chambers, 602 S. Main Street. This meeting can be viewed via livestream at http://www.joplinmo.org/182/Video-Multimedia In compliance with the social distancing requirement of six feet, the number of guests in the Council Chambers is limited to 45.

AMENDED AGENDA

1. Call to Order
2. City of Joplin I&I Reduction Program/Public Sanitary Sewer System
3. City of Joplin Private Side I&I Reduction Program-Proposed Pilot Program
4. Discussion of the Christmas Parade, Memorial Run and Mass Gatherings
5. Adjourn

If you are in need of disability related auxiliary aids or services, contact the City Clerk's Office at (417) 624-0820 ext. 220. Forty-eight hours notice is requested.

Notice posted at 1:05 p.m. on Thursday, October 8, 2020

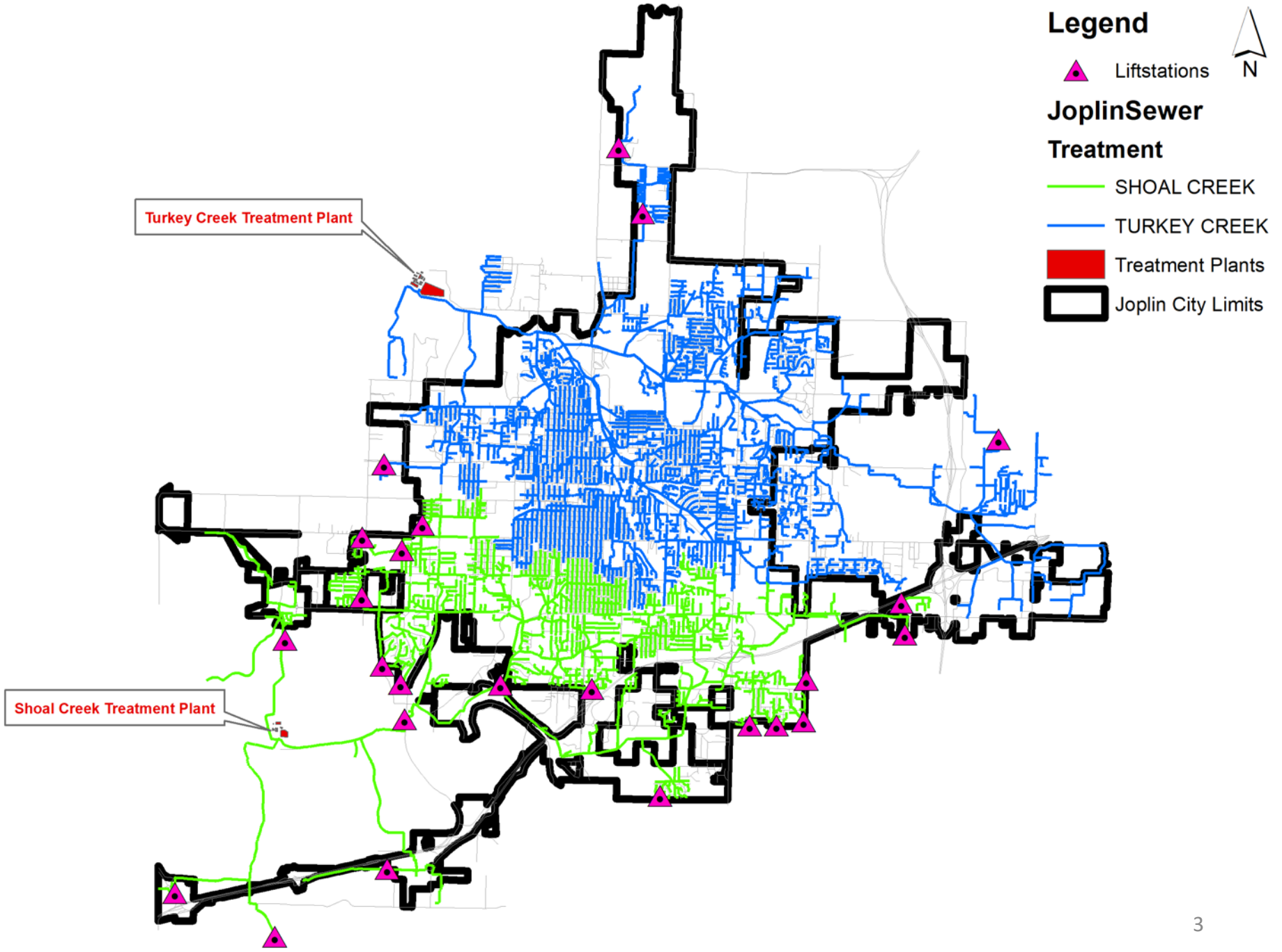
City of Joplin's
I&I Reduction Program
Public Sanitary Sewer System

October 12, 2020

Allgeier, Martin and Associates
TREKK Design Group

Joplin's Sanitary Sewer Systems

- The City's sanitary sewer systems deliver wastewater (raw sewage) to the treatment plants.
- Wastewater Treatment is regulated by state and federal agencies:
  - Operating Permits are issued by the Missouri Department of Natural Resources (MDNR) …
  - As part of the Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System.
- 2 Wastewater Treatment Facilities (WWTFs)
- Areas serviced by Joplin's WWTFs: Duenweg, Duquesne, Loma Linda, Leawood, and the Downstream Casino (Kansas/Oklahoma)


Legend
Liftstations
N
JoplinSewer
Treatment
SHOAL CREEK
TURKEY CREEK
Treatment Plants
Joplin City Limits
Turkey Creek Treatment Plant
Shoal Creek Treatment Plant

Joplin's Sanitary Sewer Systems

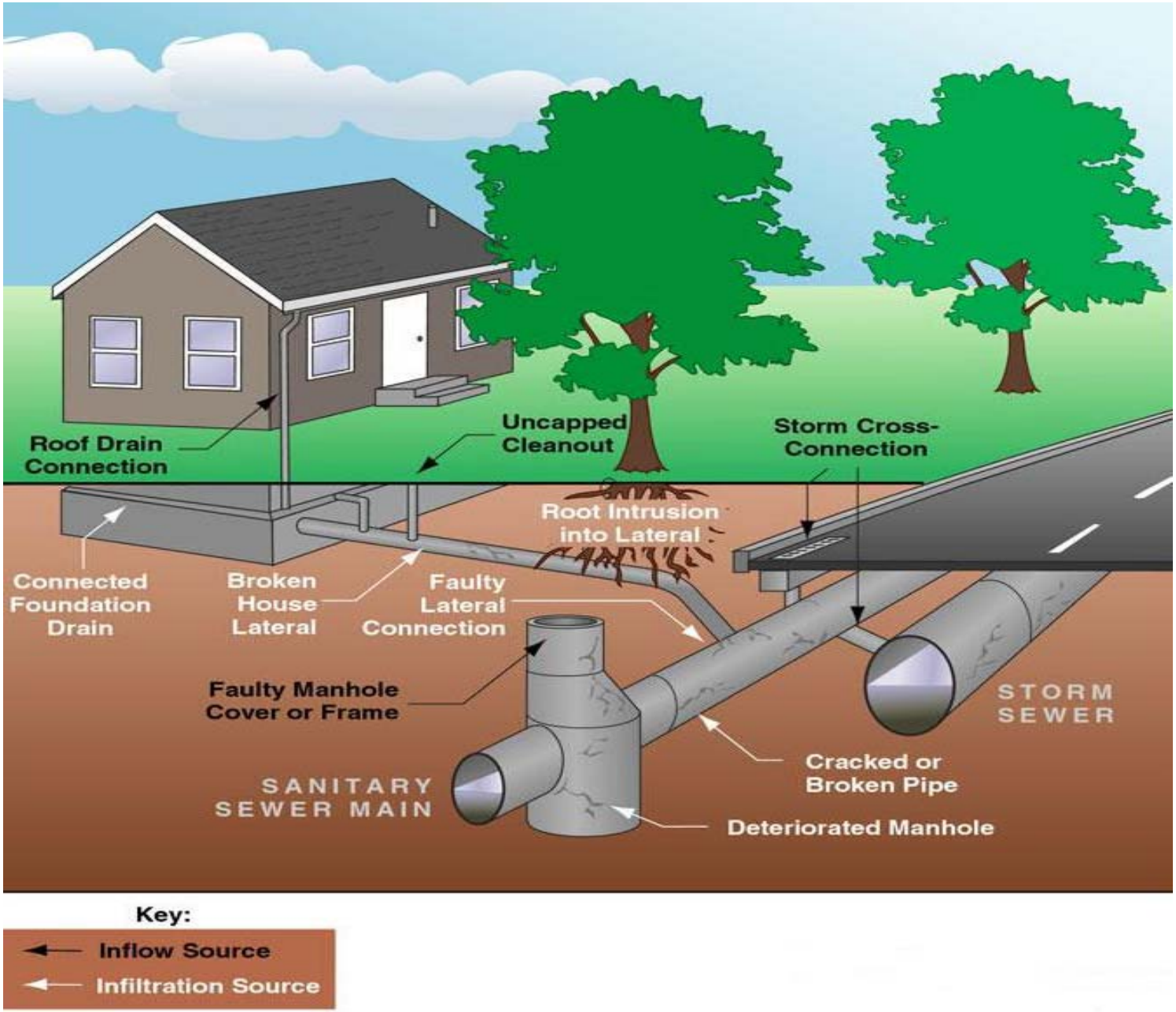
- **27 lift stations**
- **400+ miles of piping:**
  - **Mixture of ages and materials**
- **The only City of Joplin Utility Service**
  - **21,000 + customers**
- **Reliability for our customers is critical**

What is I&I?

Inflow and Infiltration

Excessive groundwater or stormwater runoff that makes its way into the sanitary sewer collection system.

Sources of Excessive I&I



What is I&I?

During wet weather, excessive I&I causes:

- **Sanitary Sewer Overflows ("SSOs");**
- **Bypasses at the WWTFs;**
- **Basement backups;**
- **Public health and environmental concerns**

Level of Service (LOS)

Since 2012, the City has routinely devoted annual resources to address the problem of excessive I&I.

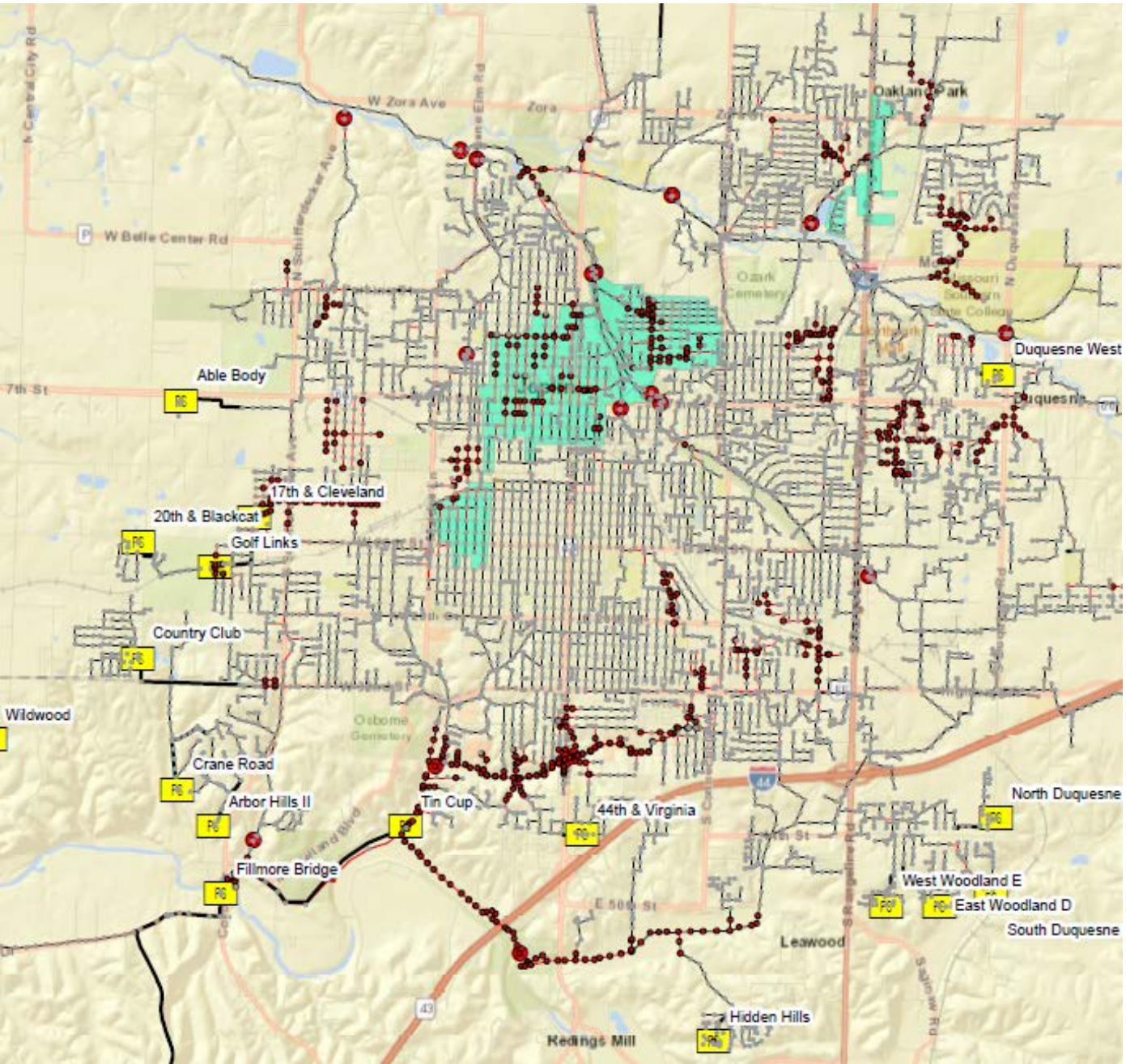
2013 – present: Cleaning & evaluation of pipes; reconstruction of defective pipes, manholes, lateral connection repairs

2017 Flow Monitoring (City wide)

2018 Hydraulic Model of the collection system

➔ LOS map

Level of Service



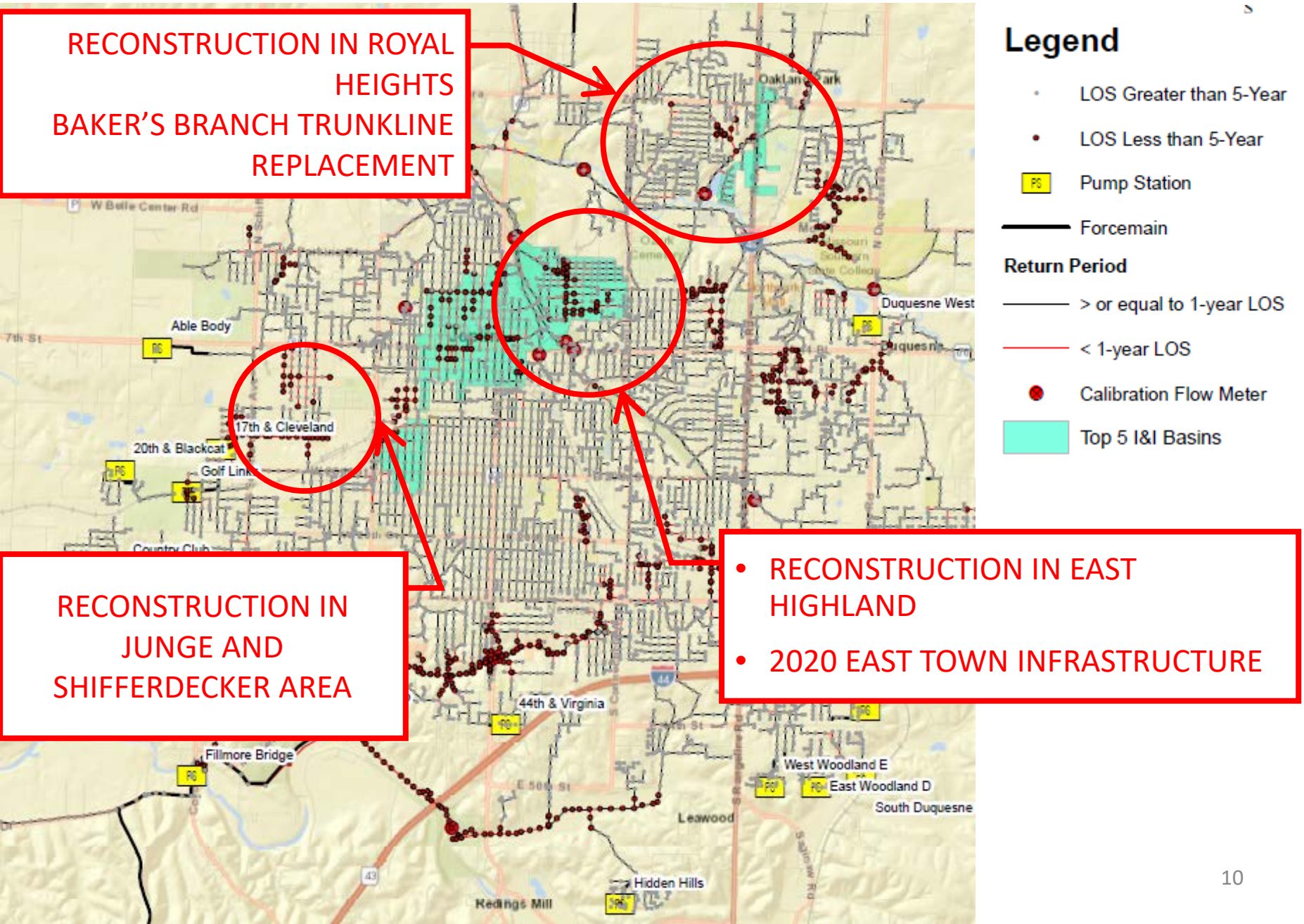
Legend

- LOS Greater than 5-Year
- LOS Less than 5-Year
- Pump Station
- Forcemain

Return Period

- > or equal to 1-year LOS
- < 1-year LOS
- Calibration Flow Meter
- Top 5 I&I Basins

Level of Service



CAPITAL IMPROVEMENTS 2015-2019

COLLECTION SYSTEM

- Tin Cup Bar Screen
- Tin Cup LS Rehab
- Fillmore Bridge LS Rehab
- Filmore Bridge Parallel Force Main
- Tin Cup Parallel Force Main
- Creek Crossings
- Twin Equalization Basin
- Point Repairs & Replacements
- SCADA

TREATMENT SYSTEM

- Turkey Creek Phase I
- Turkey Creek Phase II
- Shoal Creek Phase I
- Shoal Creek Phase II
- Added Disc Filters & UV
- (2) Screw Pumps
- (2) Boiler Replacements
- Generator Replacements
- TC (2) Sand Filters to Aqua Diamond Filters

CAPITAL IMPROVEMENTS 2020-2024

COLLECTION SYSTEM

- Tin Cup Parallel Line
- Water's Edge
- Lone Elm Interceptor
- Rehab 60" Line
- Glendale Interceptor
- I-44 Interceptor
- Pressure Mains
- Replace SS Trunk Line
- Offline Storage

TREATMENT SYSTEM

- Tertiary Filter Replacement
- Replace Digester Roofs
- 44th & Virginia LS
- Equipment Buildings
- Trickling Filter Media
- Media in Digesters
- Equalization Basins
- 20th & Blackcat LS
- Equipment: Pumps & Vehicles

MDNR

Abatement Order on Consent (AOC)

- **Council approved entering into this Agreement via Council Bill 2019-127 on May 20, 2019**
- **Established milestone goals every 3 years**

MDNR

AOC's 2026 ACTIVITIES PLAN of its SYSTEM RENEWAL & SSO PREVENTION PROGRAM

- **Established milestone goals every 3 years**

1ST MILESTONE: Years 1 - 3 (2019 - 2021)					
By the end of the 1st Milestone Period (December 31, 2021), the City will have completed the following quantities of renewal work:					
ACTIVITY	**CIPP or New PVC (LF)**	**Lateral Connection Repairs (EA)**	**Manhole Rehab (EA)**	**Smoke Testing (LF)**	**Lateral Launches (EA)**
QUANTITIES	**11,100**	**270**	**45**	**60,000**	**710**

MDNR

- **City's Year 1 Report (2019 Achievements)**

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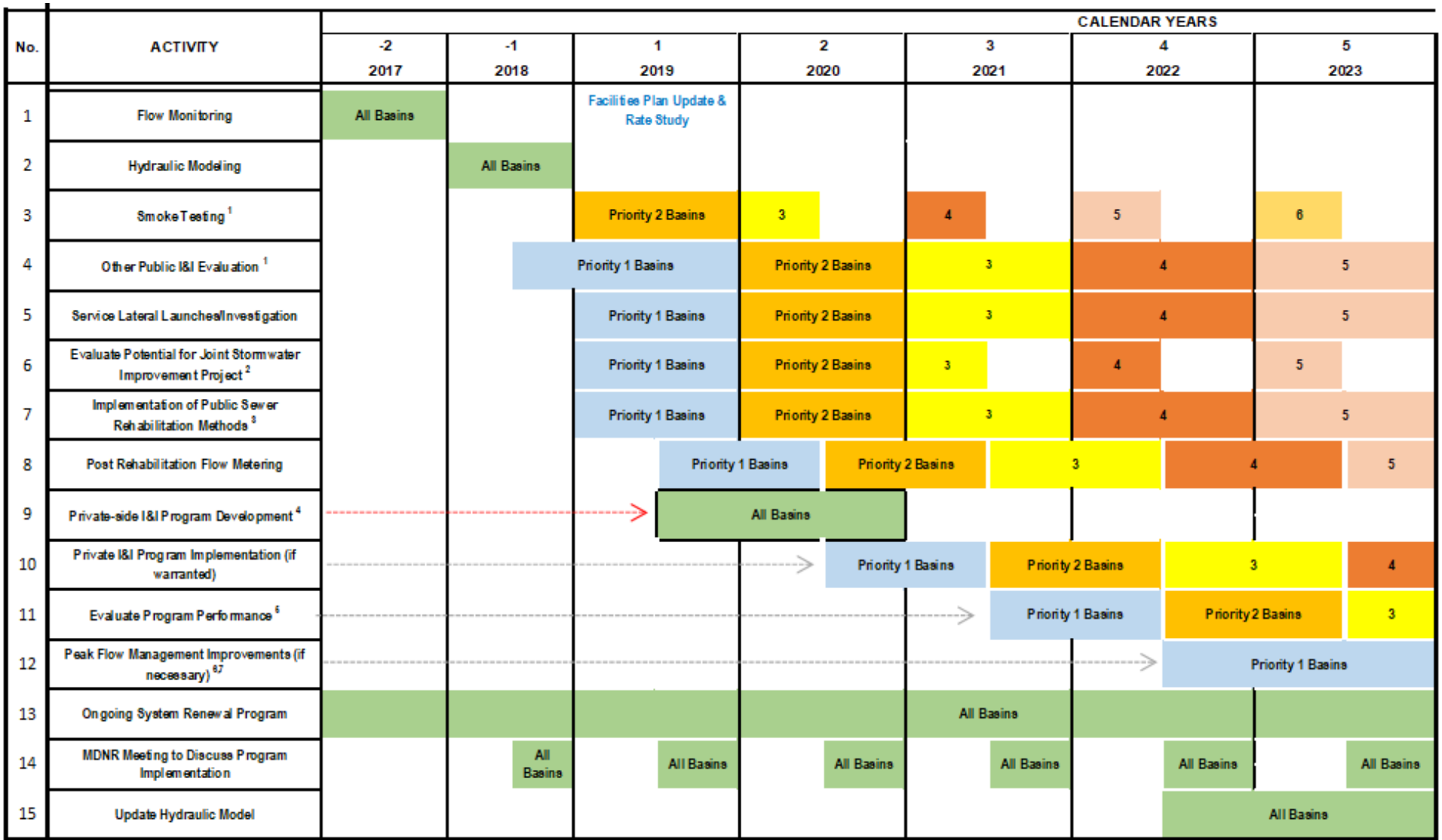
QUANTITIES		11,100	270	45	60,000	710
ACTUALS, to Date:	Totals:	11,410	168	48	123,093	57
	% of 3-Year Goals:	103%	62%	107%	205%	8%

"...For the reporting year, the City surpassed its interim milestone schedule of goals, with the lone exception being the quantity of lateral launches performed. This fact was due to two primary factors: 1) emphasis on public infrastructure rehabilitation within priority basins; and 2) the lack of an official private-side inflow and infiltration (I&I) program. City staff anticipate that the number of lateral launches will increase dramatically once work begins in earnest to removing sources of private-side I&I..."

MDNR

Strategy: systematic & progressive



In Summary…
Why is Joplin Investing in an I&I Reduction Program?

The Problem: Excessive flows from rainfall negatively impact the system:

- **by reducing the reliability of the collection system;**
- **by overwhelming the WWTFs;**

In Summary…
Why is Joplin Investing in an I&I Reduction Program?

The Solution: Strike a balance in costs between …

- **Transport and treat**
- **Removal of I&I**
  - **Found to be a cost-effective solution when used correctly**

In Summary…
Why is Joplin Investing in an I&I Reduction Program?

Benefits to City:

- **Renews aging and deteriorating sewer assets**
- **Maximizes existing capacity for new growth**
- **Eliminates or delays large capital projects in master plans**

Why is addressing Private I&I with Public I&I Important

- **For Joplin to be successful in reducing I&I, both Public and Private sources should be addressed.**

- **Two-pronged approach:**
  - **Public rehab will continue in order to maintain reliability of the sewer system.**
  - **At least 50% of I&I comes from private sources.**

Any Questions?

City of Joplin's
I&I Reduction Program

City of Joplin, Missouri
Private Side I&I Reduction Program
Proposed Pilot Program

October 12, 2020

Allgeier, Martin and Associates
TREKK Design Group

Why is Joplin Investing in an I&I Reduction Program?

The Solution: Strike a balance in costs between …

- **Transport and treat**
- **Removal of I&I**
  - **Found to be a cost-effective solution when used correctly**
  - **Private-side I&I removal has been found to be a cost-effective strategy for removing I&I from within the collection system.**

Why is addressing Private I&I with Public I&I Important

- For Joplin to be successful in reducing I&I, both Public and Private sources should be addressed.
- Water Environment Research Foundation (WERF) Studies indicates that approximately 75% of I&I enters the system through private sources.

Why is addressing Private I&I with Public I&I Important

- **Proven results from Springfield, their I&I reduction program was started in 2013 and is currently on-going.**

Why is addressing Private I&I with Public I&I Important

- Springfield has reduced system wide wet weather flows by 42% and dry weather flows by17%.

- Springfield has not experienced bypasses at its plants since 2016

Why so much I&I from private property?

Common plumbing practices prior to 1980 was to connect these sources to the lateral:

1. Sump Drain
2. Downspout Connections
3. Window Well Drains
4. Driveway Drains
5. Basement Entry Drains
6. Foundation drain

Other sources that allowed rainwater to enter laterals:

1. Clean outs
2. Leaking Laterals – Faulty Joints
3. Root Intrusion
4. Floor drain "taps"

Benefits of Private I&I Programs

Cost Effective – Springfield found:

- **Removing Public I&I costs almost 10 times the cost of removing Private I&I.**
- **Springfield spends almost $2M/year to remove Private I&I and almost $22M/year to remove Public I&I.**

Return on Investment to address Private I&I with Public I&I

Return on Investment (ROI) – Springfield found:

- **For every $1 spent on removing private I&I, the City found it could avoid spending more than $11 in capacity improvements.**

Percent of Houses with Defects Average Cost Per House

Per Cent of houses with defects Typical cost per house – Springfield found:

- **About 25% of the houses in a basin were found to have defects.**
- **The average cost per property was to remove defects through phase IV was $1,935.**

Should City Fund Private I&I or Split Cost with Homeowners

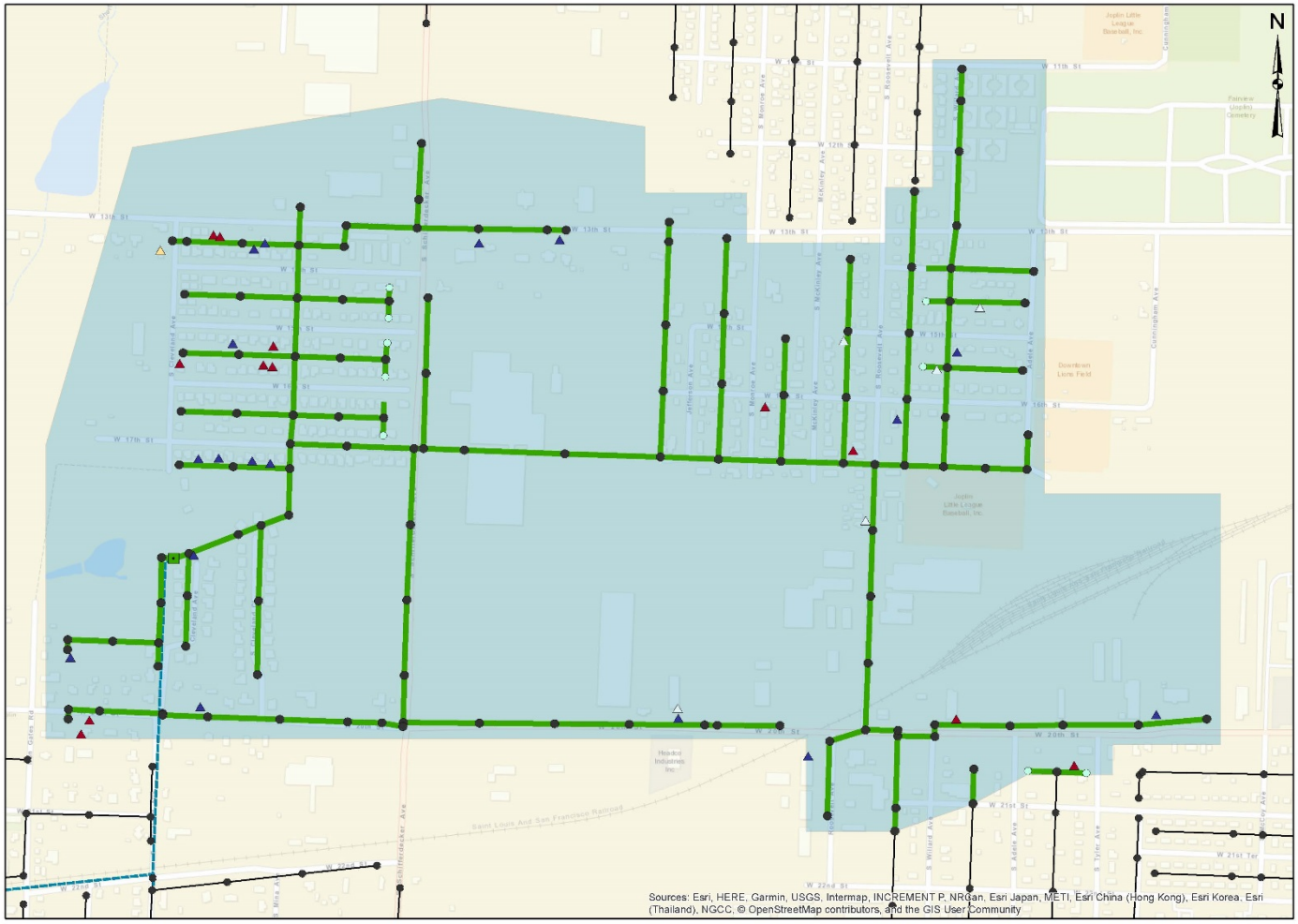
City Funded

- **Greater Homeowner Participation Rate**
- **Springfield Realized 90% to 95% Household Participation Rate**

Split Cost with Homeowners

- **Other Cities that Split the Cost with Homeowners Realized 40% to 50% Homeowner Participation Rate**

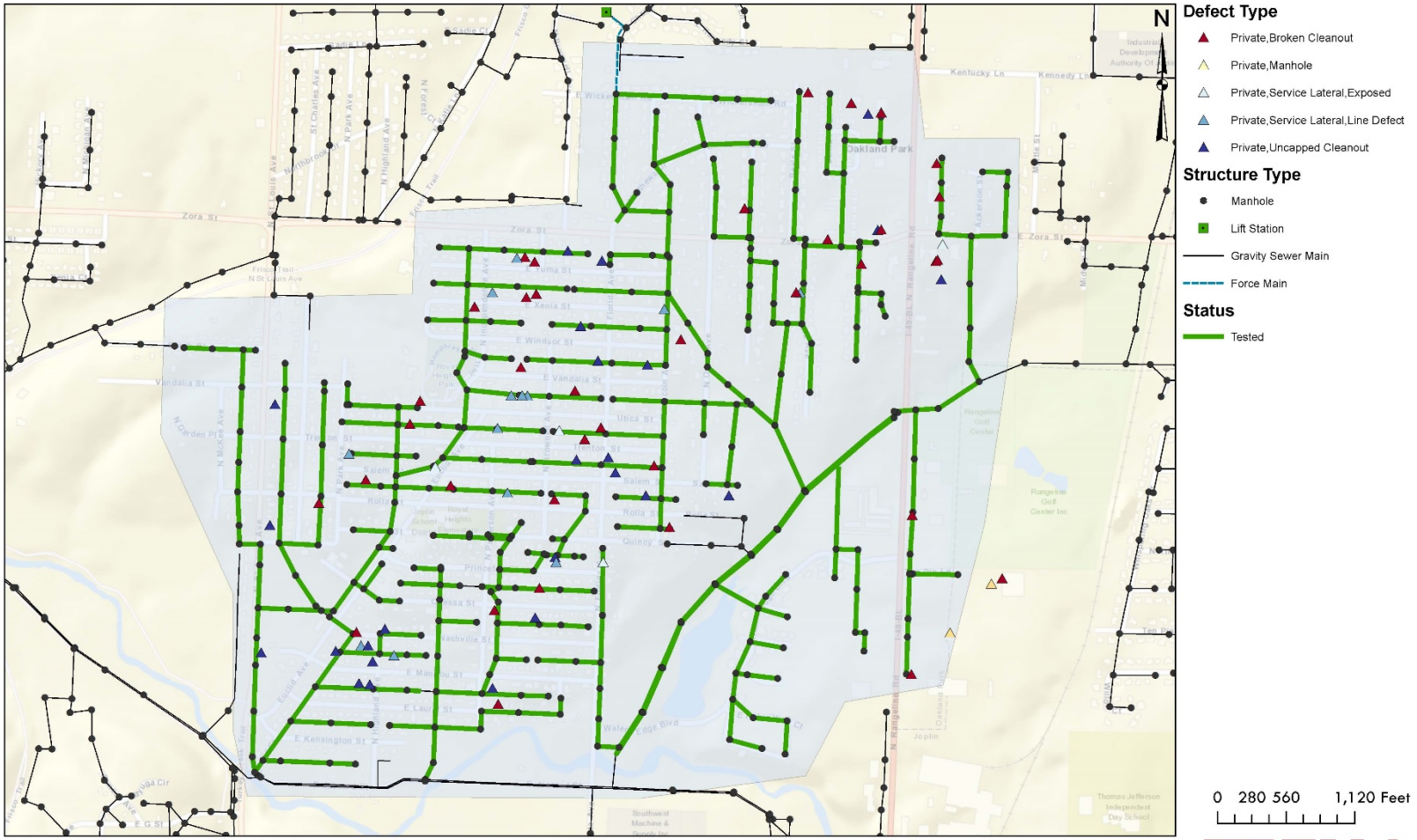
Private Priority 1 – Cleveland Basin



Joplin MO - Cleveland Basin Smoke Testing

TREKK DESIGN GROUP, LLC

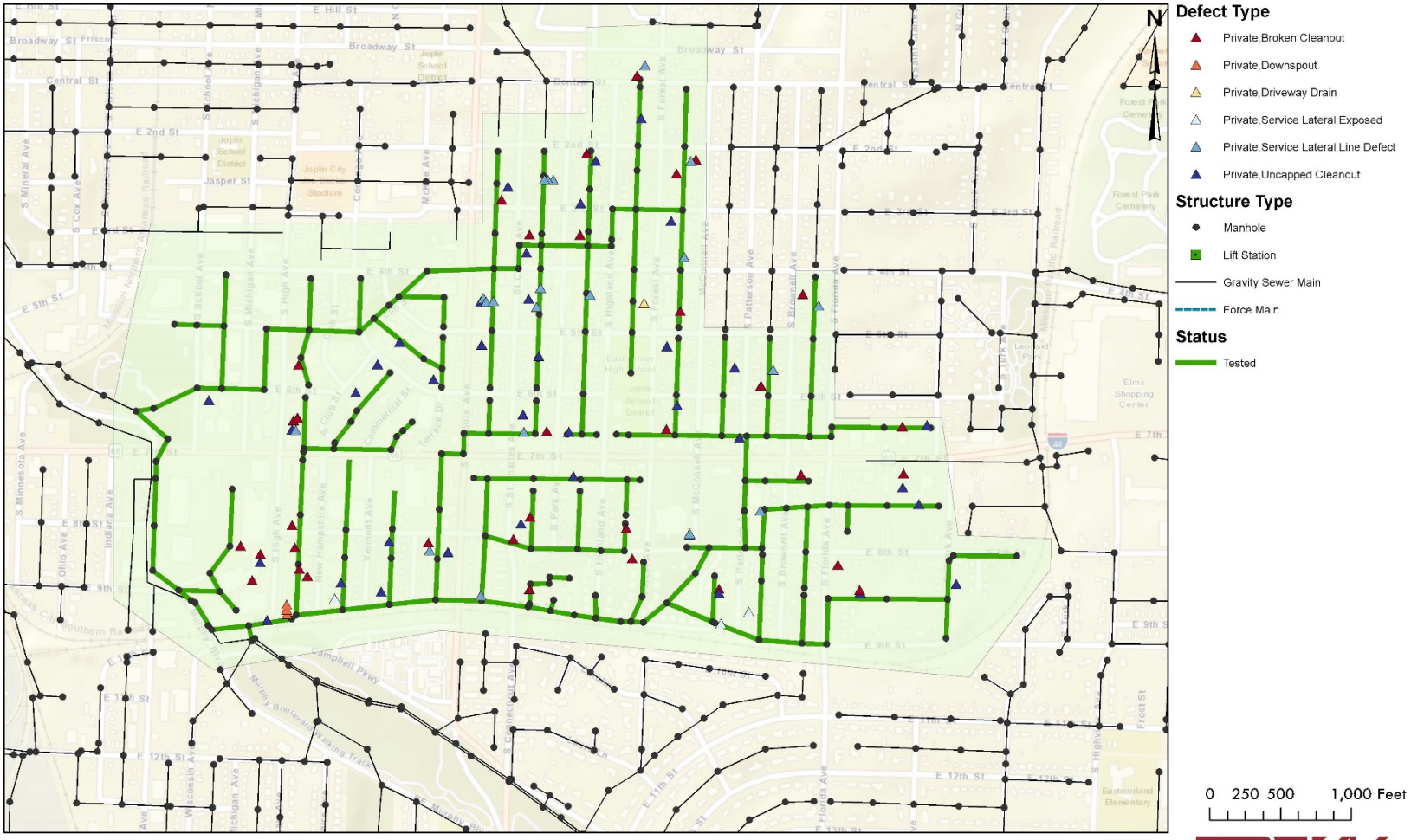
Priority 2 – Bakers Branch Basin



Joplin MO - Bakers Branch Basin Smoke Testing

TREKK DESIGN GROUP, LLC

Priority 3 – Eastmorland Basin



Joplin MO - Eastmorland Basin Smoke Testing

Reason for Fixing Defects Appropriately

Clean Out Repairs

- **When cleanouts are broken, it is generally for a reason. If not properly protected they will likely break again.**
- **Springfield smoke tested the City in early 2000s and located the clean outs that were broken. They smoke tested again in 2012 and 2013 and found that 90% were still emitting smoke.**
- **Springfield tried just replacing clean out caps, realized that wasn't sufficient so a more permanent repair was developed.**

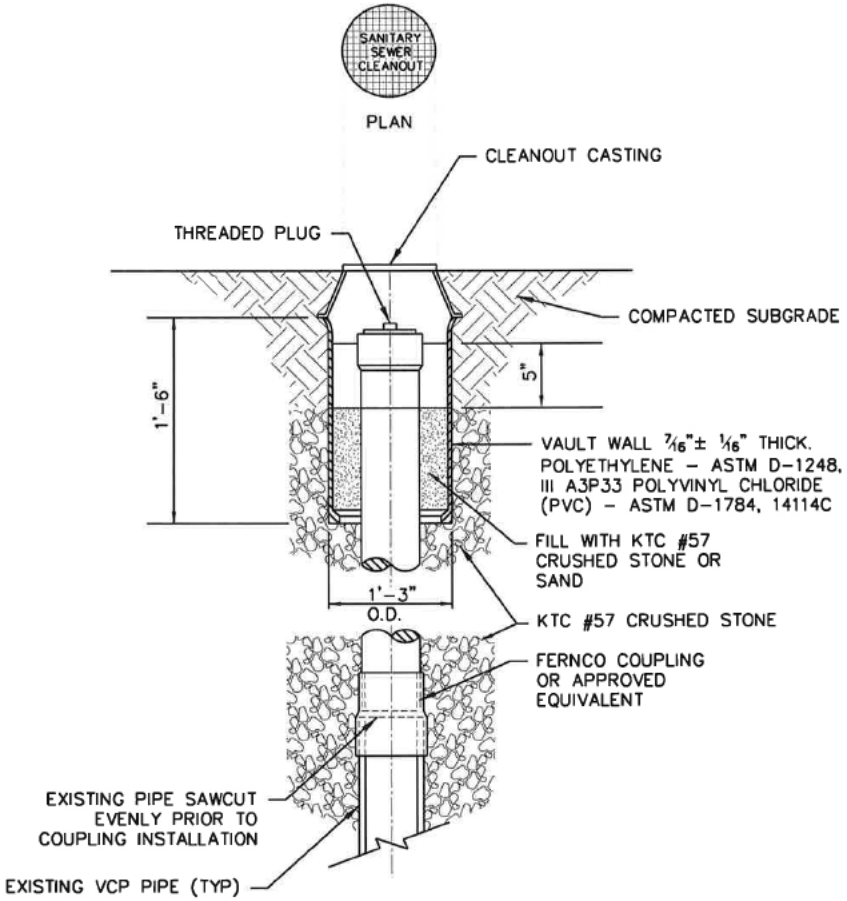
Reason for Fixing Defects Appropriately

Sump Pumps and Downspouts

- **When sump pumps and downspouts are disconnected from the sanitary sewer, the water must drain away from the house or they maybe reconnected by the homeowner. This can be accomplished in several ways**
  - **If there is positive drainage away from the house a splash plate may be adequate**
  - **If there is a storm water facility or a storm water ditch close by then the water can be drained to those facilities**

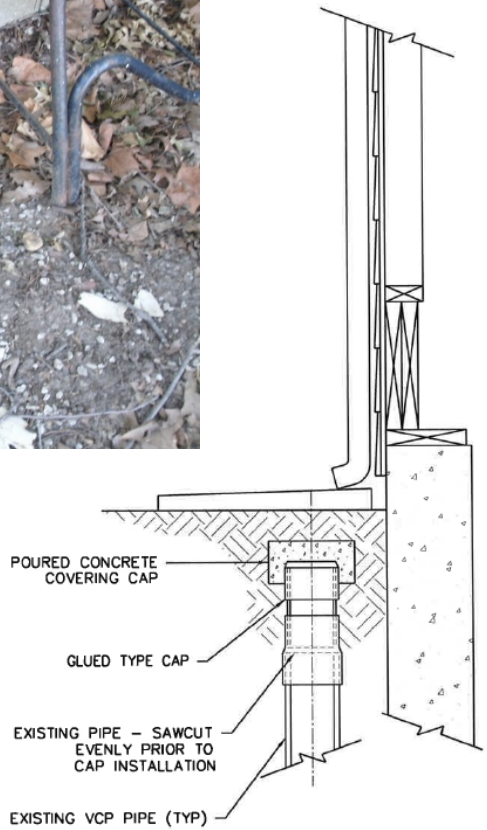
Repair Strategies





Repair Strategies



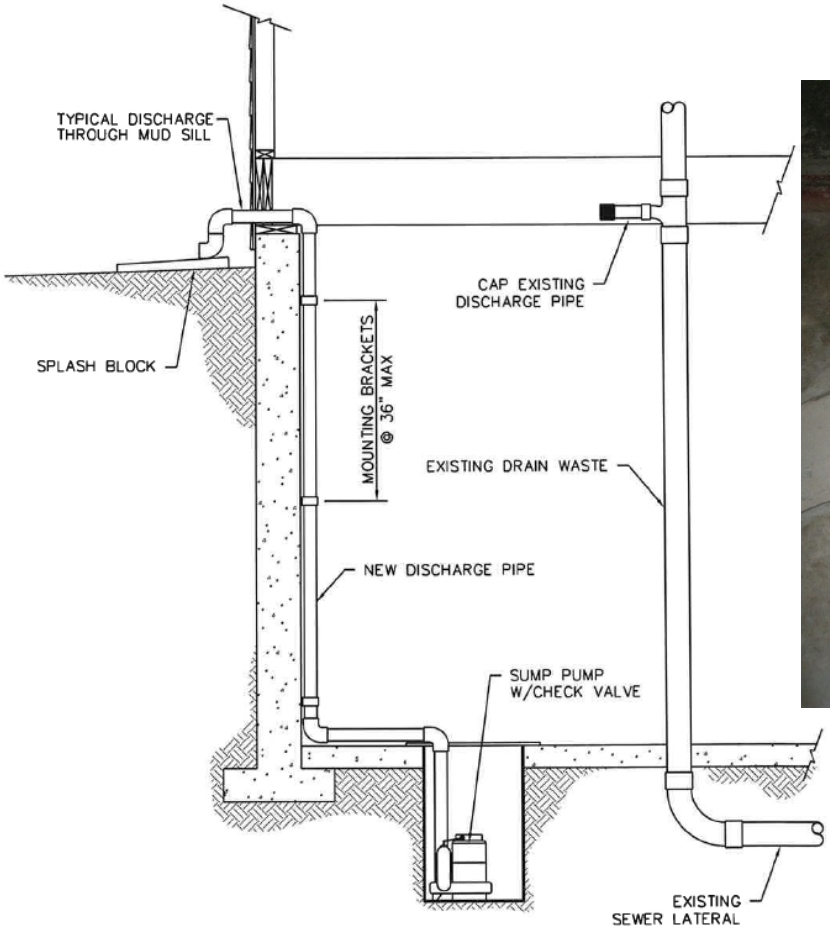






Repair Strategies







Local Partnering Opportunities

Utilize Local Plumbing Contractors

Tri-State Area Contractors Association

Home Builders Associations

Private I&I Program Basics

What is a typical private I&I Program?

- **City contacts residents about participating in the voluntary program**
- **Evaluation of plumbing in structures to find improper sanitary sewer connections**
- **Evaluations take about 15-30 minutes – look in basement, crawl space, and around structure exterior**

Private I&I Program Basics

What is a typical private I&I Program?

- **Checking sump pumps, downspouts, drains, clean outs, etc.**
- **City manages a list of licensed, pre-qualified plumbers**
- **Project Team arranges and coordinates the disconnections – City pays for repairs**

Develop Public Outreach Program

City's PIO Department

City's Website - Interactive Map.
(Citizens can find their house on the map)

News Media – Newspaper, Radio and TV

Open Houses City Wide and in the Selected Basins

Letters and Door Hangers

Plumber Procurement Process

Hold Mandatory Pre-Qualification Meeting with Plumbers

Solicit Qualifications for Plumbers Licensed in Joplin

Solicit Estimates of Costs for Elimination of Defects from Qualified Plumbers

Set a Reasonable Unit Price to Repair the Defects

Plumber Procurement Process

Execute Contracts between City and Plumbers – Plumbers and Homeowners

Begin Building Evaluations

Engage Plumbers to Perform Defects Disconnects

Inspect Defect Disconnections, to Ensure the Disconnects were Properly Performed

Process Plumber Payments

Anticipated Costs

Projected Construction Costs to Repair Defects in Selected Basins:

- **Cleveland Basin – 27 Residential and 8 Commercial Repairs Anticipated for a total of $45,000**
- **Bakers Branch – 22 Residential and 18 Commercial Repairs Anticipated for a total of $156,000**
- **Eastmorland Basin – 73 Residential and 24 Commercial Repairs Anticipated for a total of $201,000**

Council Actions

- **Decide to Proceed with a Private Side I&I Reduction Program**
  - **A Pilot Project in at least 2 basins**
  - **Report at end of project with results**

- **Approve Work Authorization with the AMA Team to Proceed with Development of a Pilot Project**

Pilot Program Actions

Review of Joplin's Ordinances for Necessary Changes

Review of Program by Joplin's Legal and Purchasing Departments

Train Joplin's Public Works Personnel

Send out RFQ to Qualified Plumbers

Determine Fair Cost for Selected Defects

Begin Pilot I&I Reduction Program

Pilot Program Actions

Engage Plumber to Perform Defect Disconnections

Inspect Defect Disconnections to Ensure They were Completed Correctly

Process Plumber Payments

Perform Post Project Flow Monitoring

Quantify Success

Any Questions?

City of Joplin, Missouri
Pilot Private I&I Reduction Program