City of Fayetteville North Carolina

Stormwater Infrastructure

Maintenance, Repair and Replacement

Stormwater Infrastructure - Maintenance, Repair and Replacement

Goal

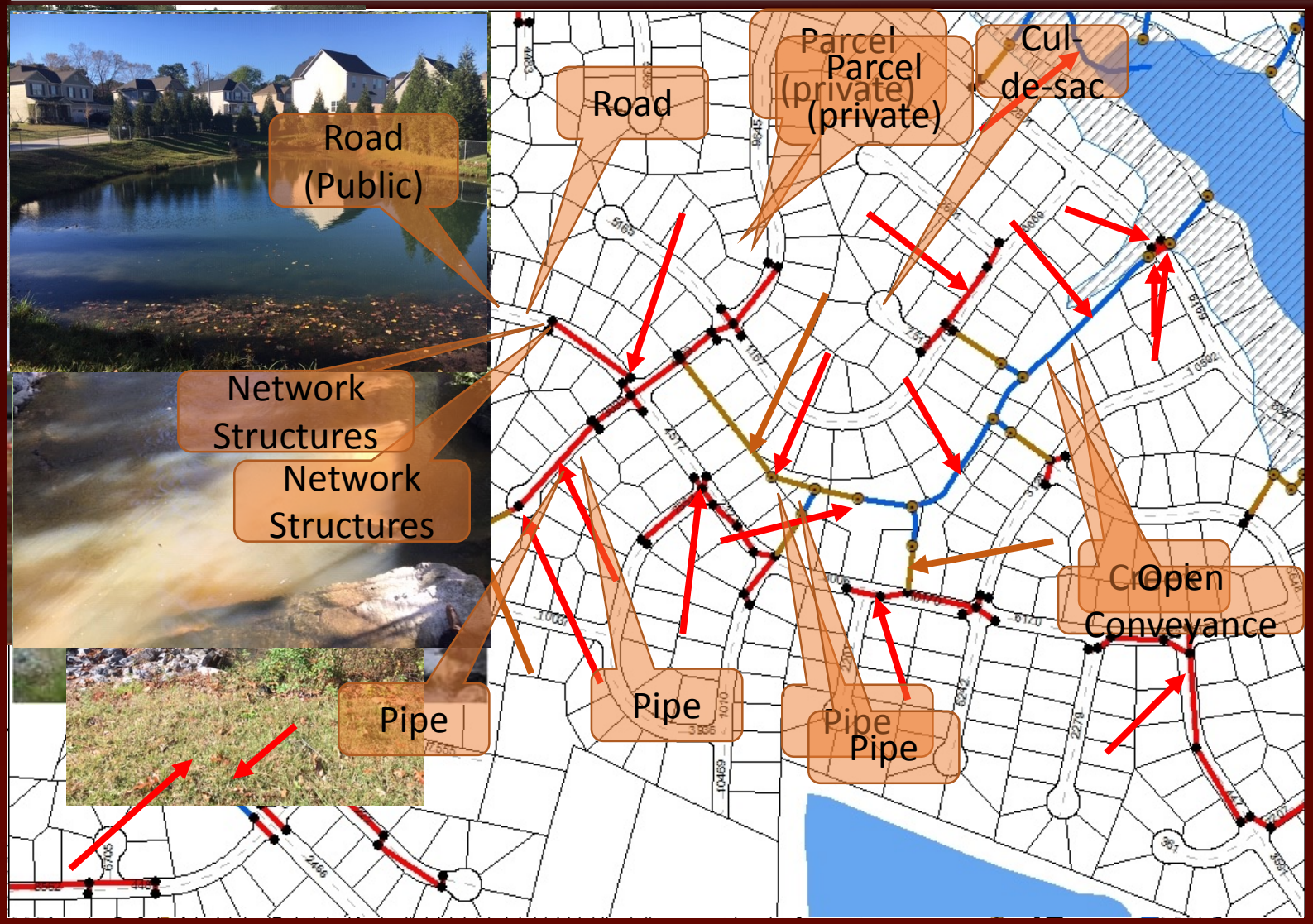
Educate Council Members on the extent of City responsibility to maintain, repair, remove and replace stormwater infrastructure within City Limits.

- What is Stormwater Infrastructure
- Easements & Legal Responsibility
- Peer City/CoF Comparison
- Potential Liability
- Options for Private Properties
- Council Direction

City of Fayetteville North Carolina

What is Stormwater Infrastructure

What is Stormwater Infrastructure



Assets

- Stormwater Pipe network
  - In the road (Public RoW)- Red
  - Off RoW - Brown
- Stormwater Network Structures
  - Catchbasins
  - Inlets
  - Headwalls
- Open Conveyance
  - Roadside Swale
  - Backyard creek or ditch
  - Stream
  - Retension Basin (SCM)

City of Fayetteville North Carolina

What stormwater or drainage infrastructure does the City have legal responsibility to maintain and/or repair?

Helpful Distinction:

PUBLIC RIGHT-OF-WAY

Commonly referred to as a “city street”

Triggers a **DUTY** under STATE LAW

EASEMENT (on private property)

No duty triggered

Grants **PERMISSION** for a purpose

City of Fayetteville North Carolina

CITY'S MAINTENANCE DUTY UNDER STATE LAW FOR **PUBLIC RIGHTS-OF-WAY or STREETS**

NCGS 160A - 296(a)(1)

"A city shall have general authority and control over **all public streets**, sidewalks, alleys, bridges, and **other ways of public passage** within its corporate limits … [and has] [t]he **duty** to keep the public streets, sidewalks, alleys, and bridges in proper repair."

City of Fayetteville North Carolina

CITY'S MAINTENANCE DUTY UNDER STATE LAW FOR **PUBLIC RIGHTS-OF-WAY or STREETS**

When does a City assume the duty or OBLIGATION to maintain streets (which includes drainage)?

- When streets are dedicated for public use, and
- The City accepts the streets for maintenance either EXPLICITY OR IMPLICITY

CITY'S MAINTENANCE DUTY UNDER STATE LAW FOR **PUBLIC RIGHTS-OF-WAY or STREETS**

More on the City's IMPLICIT acceptance of rights-of-way for maintenance (including drainage). Cases have found municipal control when a city has:

Maintained or repaired drainage, sewer lines and other utilities in a private right-of-way or easement;

City of Fayetteville North Carolina

CITY'S MAINTENANCE DUTY
PUBLIC STREETS

SUMMARY

PUBLIC RIGHT-OF-WAY

Commonly referred to as a "city street"

Triggers a **DUTY** under STATE LAW

EASEMENT (on private property)

Grants PERMISSION for a purpose

No duty triggered

BUT a legal obligation to maintain could be legally triggered by the city's implicit acceptance for maintenance.

Peer City/CoF Comparison

What do other Municipalities in NC do

Durham (267,743, 108 mi^2

- Drainage System Ownership and Maintenance Responsibility: The owner of the property where a drainage system is located is legally responsible for its maintenance. This includes all features of the drainage system such as ditches, stream banks, and even buried pipes. **The city only owns and maintains the stormwater drainage system within the public right-of-way and other property owned by the city**.

Winston-Salem (244,605, 133 mi^2)

- The mission of the Stormwater Management Program is to restore, protect, and preserve the surface waters within the City of Winston-Salem and to **maintain, repair, map, and evaluate drainage systems within the street right-of-ways**.

Cary (165,904, 59 mi^2

- Storm drainage features such as streams, swales, pipes and culverts on a homeowner's property are the responsibility of the home owner as stated in the Certificate of Ownership and Dedication, required on all subdivision plats recorded in the Town of Cary. **The Town only maintains drainage in the right-of-way**.

What do other Municipalities in NC do

City	Population	Area (Sq. Mile)	Public RoW	off RoW
Raleigh	464,758	145	✓	×
Durham	267,743	108	✓	×
Winston-Salem	244,605	133	✓	×
Cary	165,904	59	✓	×
Wilmington	119,045	41	✓	×
Highpoint	111,513	55	✓	×
Asheville	91,902	45	✓	×
Chapel Hill	59,862	19	✓	×

Others vs City of Fayetteville

Stormwater management facilities shall mean those structures and facilities that are designed for the collection, conveyance, storage, treatment and disposal of stormwater runoff into and through the drainage system. This includes all stormwater quantity and quality facilities.

CoF Article 3, Section 23

Prior to 10-27-2008

There was no ordinance … for stormwater systems in th… communicated via easem…

Post 10-27-2008

All stormwater management facilities shall be privately owned and maintained unless the city accepts the facility for city ownership and maintenance.

The City shall accept functional maintenance responsibility of structural stormwater management facilities that are installed pursuant to this article following a warranty period provided the stormwater management facility only serves a single-family detached residential development or townhomes all of which have public street frontage.

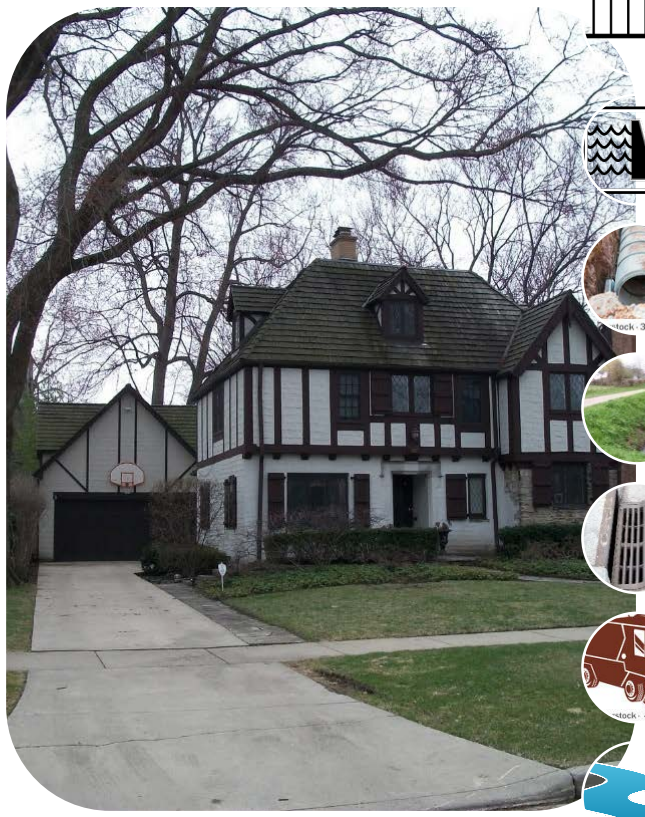
Summary - What does the City have Legal Responsibility to Maint Remove and Replace

Except ~ 42 Stormwater Management Facilities from Single Family Residential Development's post 2008 ordinance

RoW (Non-DOT) ✓

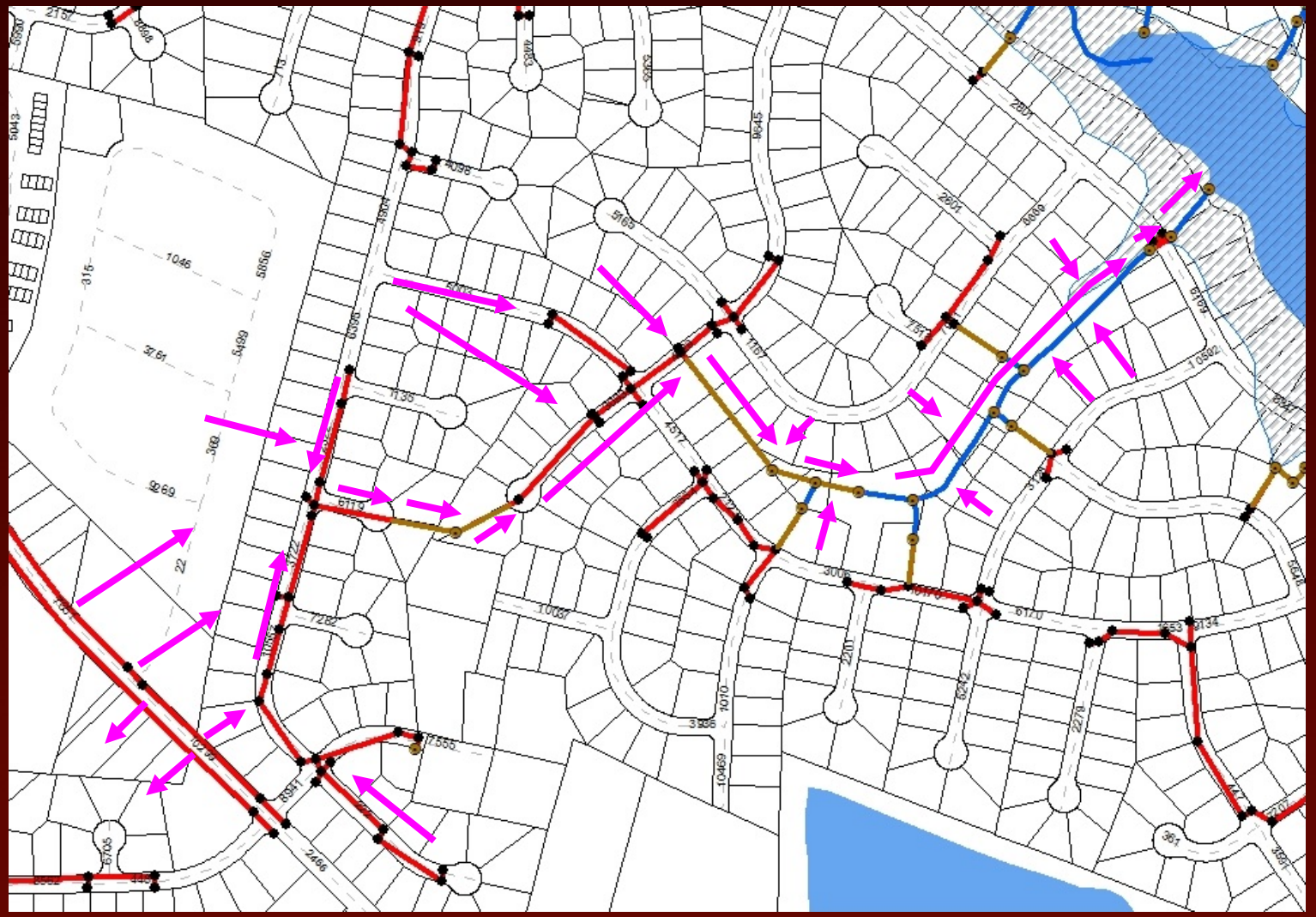
- 19 Bridges
- 6 CoF Dams
- ~ 243 mi. Pipes-Culverts
- ~ 20 mi. of Open Conveyance
- ~17401 Network Structures
- 743 mi. - Street Sweeping
- <1 mi. Streams

Off RoW – Private ✗



- ~13 Bridges
- ~45 Dams, 4 PWC
- ~ 180 mi. Pipes-Culverts
- ~ 106 mi. Open Conveyance
- ~9354 Network Structures
- 0 mi. Street Sweeping
- ~180 mi. Streams

What is Stormwater Infrastructure: Public RoW versus Off RoW - Stormwater Flow



Stormwater Flow Path

- Stormwater flows through the storm sewer systems, ditches, and channels located in the:
  - public RoW
  - on a dedicated private storm sewer easements
  - private property without easement
- Majority of the runoff is off private property

Legal Responsibility versus Practice

Off Row - Removed and cleared debris in ditches, removed sediment and blockages, fixed sinkholes and inlet structures, removed trees in creeks, provided grading and realignments to prevent yard flooding

Inconsistent in applying administration of core responsibilities

Staff have offered and applied various interpretations of easement and plat language in an attempt to be customer focused

Conflicting Information

Not been focused and/or unable to provide services uniformly and fairly within the bounds of a vetted process

City of Fayetteville North Carolina

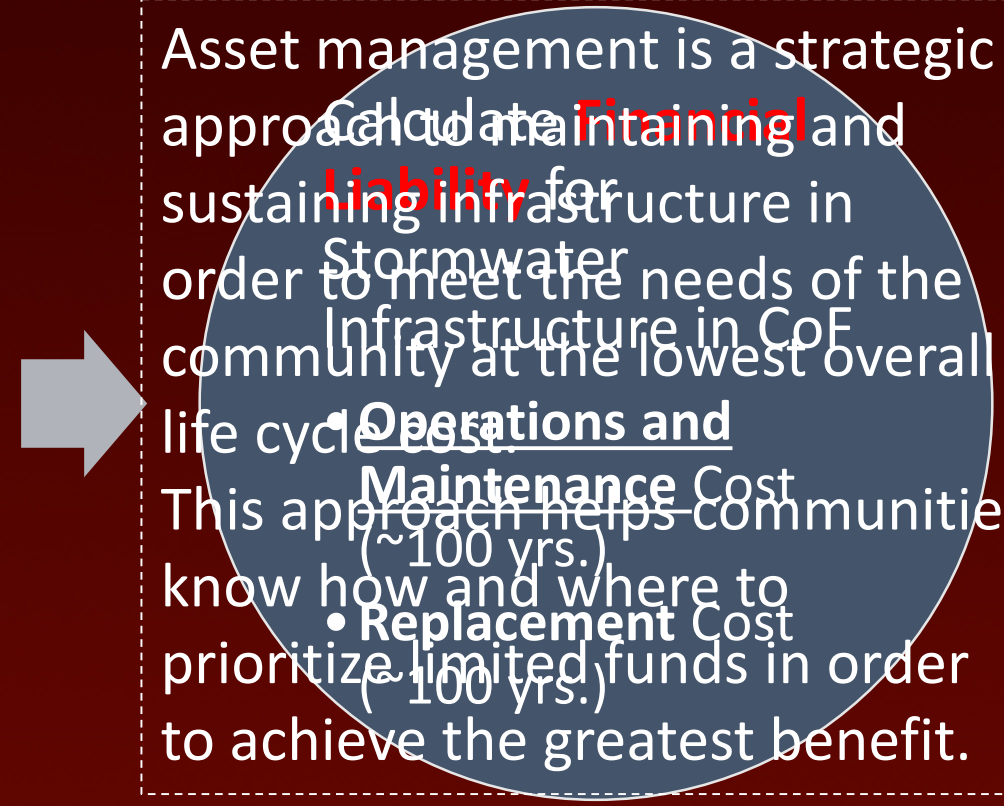
What is our Potential Liability

Potential Liability – Asset Management Approach

RoW ✓

+

off RoW ✗



Asset management is a strategic approach to maintaining and sustaining infrastructure in order to meet the needs of the community at the lowest overall life cycle cost.
This approach helps communities know how and where to prioritize limited funds in order to achieve the greatest benefit.

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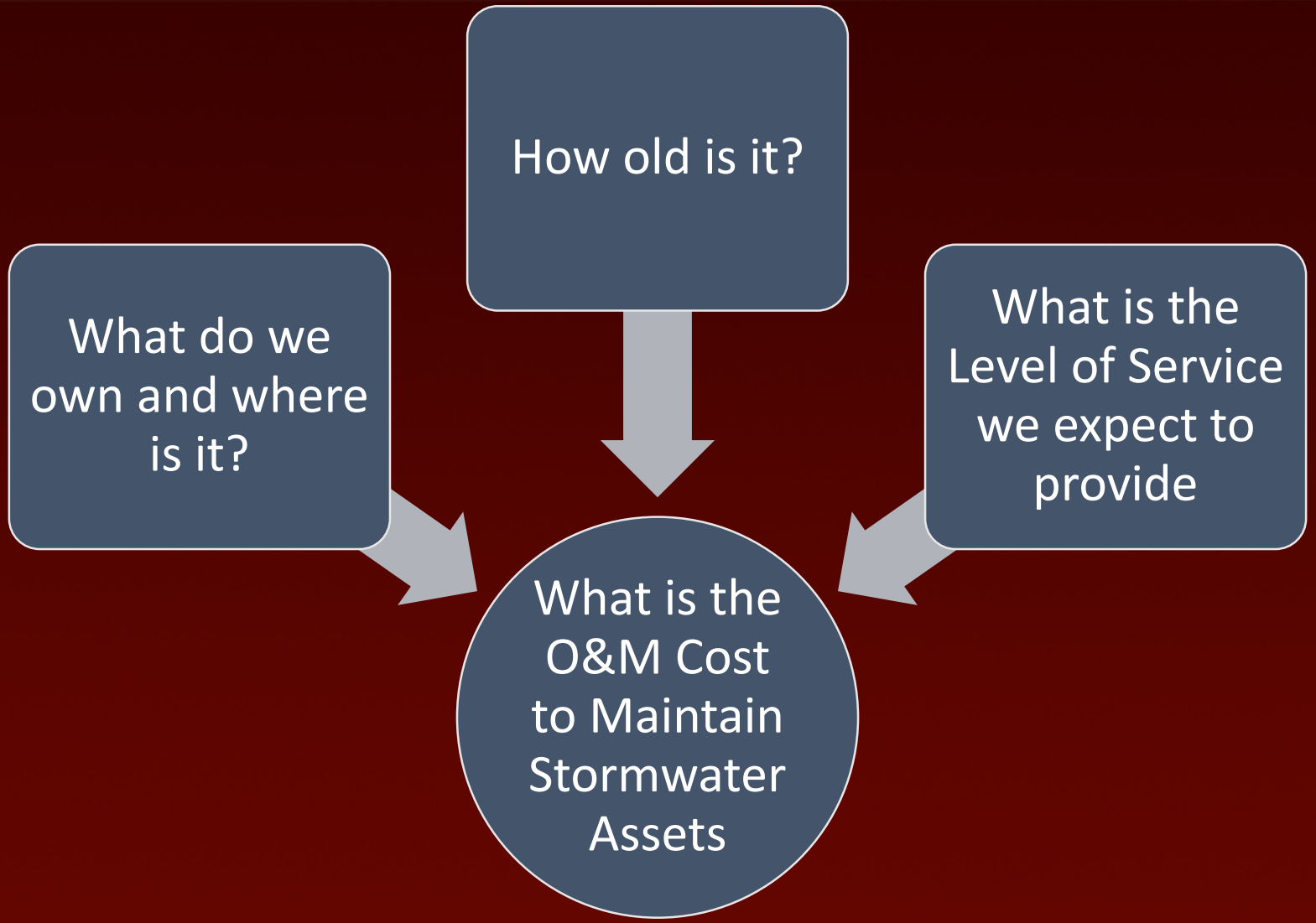
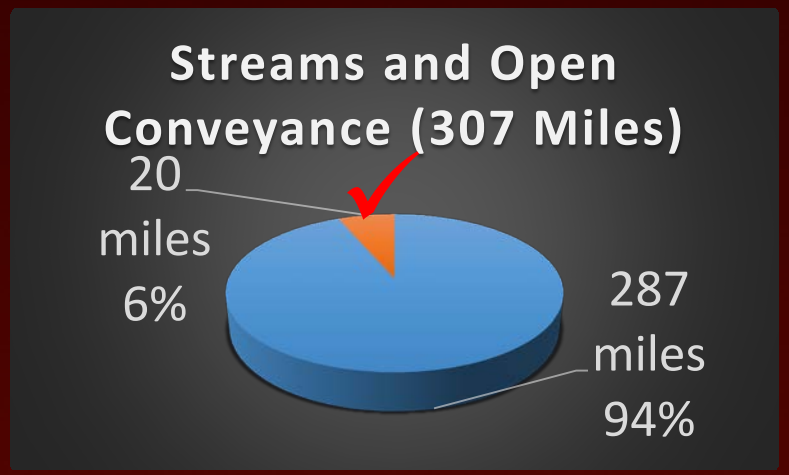
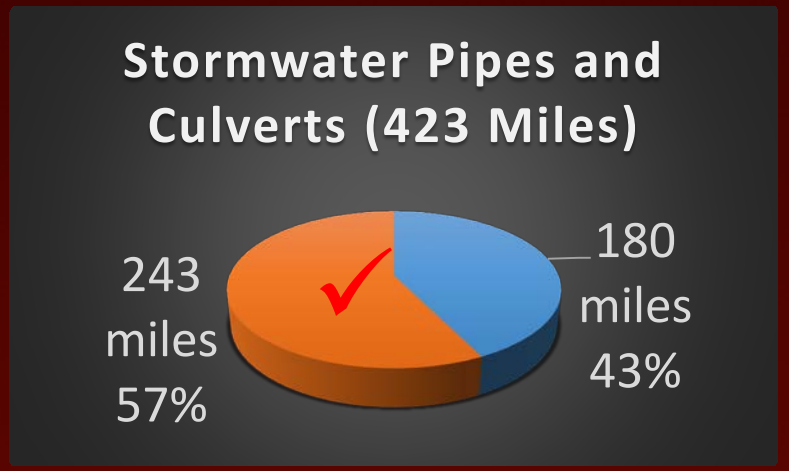
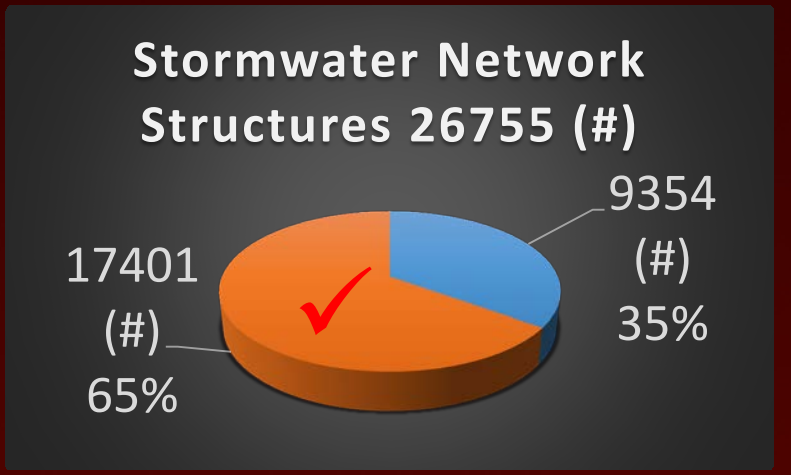
What is the O&M Cost to Maintain Stormwater Assets

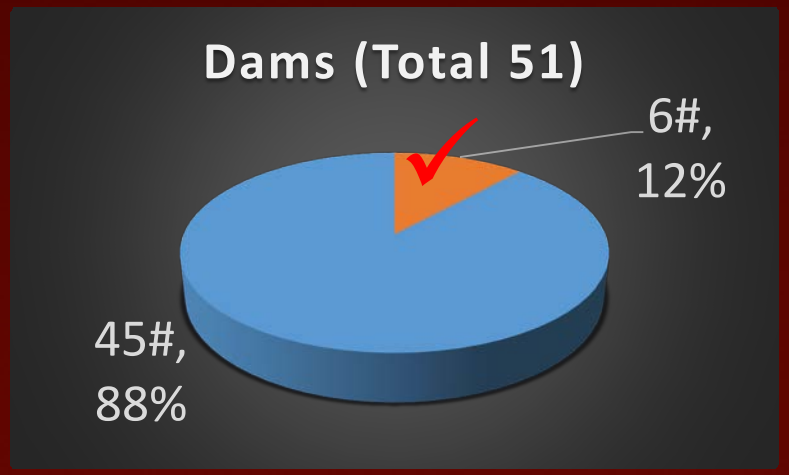


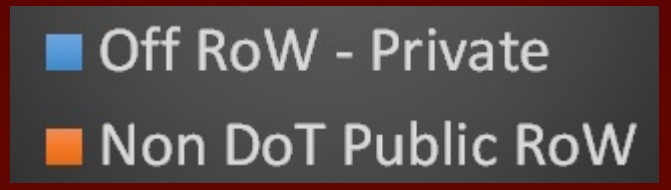
Potential Liability - What do we own and Where is it?

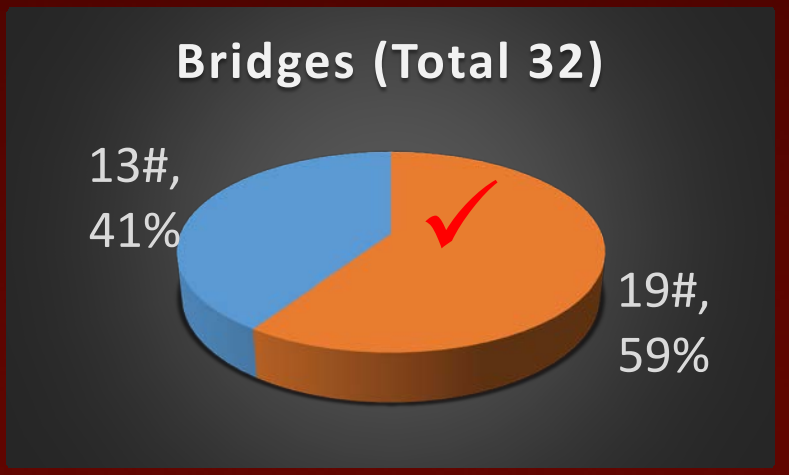




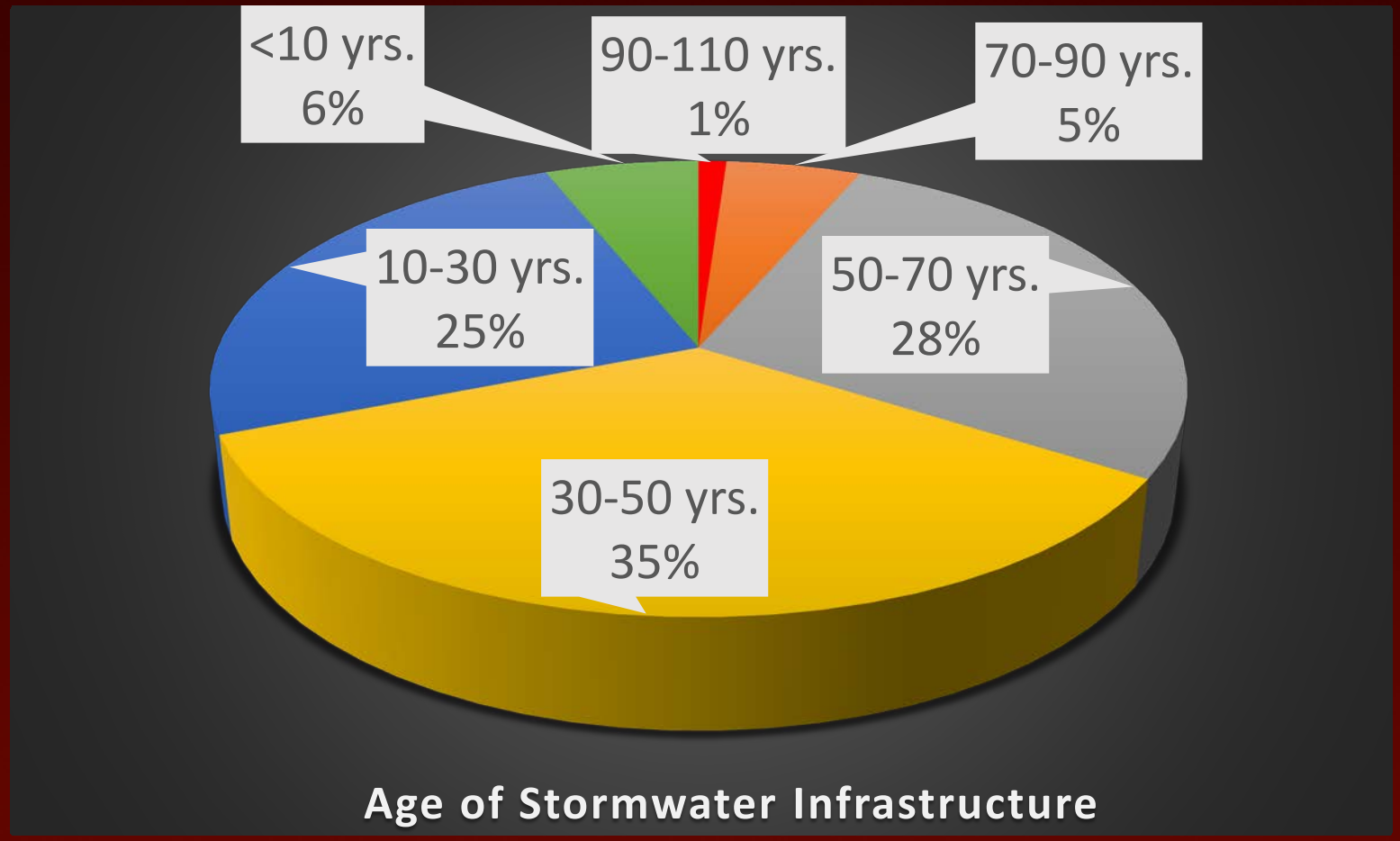








O&M –What is the age of Infrastructure



Age ↑
O&M ↑
Replace →

O&M Cost based on Level of Service

Level of Service is defined as the service quality for a given activity. Levels of Service are often documented as a commitment to carry out a given action or actions within a specified time frame in response to an event or asset condition data.

Minor Rehab. – Pipe/Struc

Minor Rehab. Dams

Minor Rehab. Bridge St
Cycle

Street Sweeping –
– 6 Cycles/yr.

RoW✓/off-RoW

SCM (2008 Ordinance) – 1 Yr. Cycle

Drainage Ditch/Shoulder Maintenance – 5 Yr. Cycle

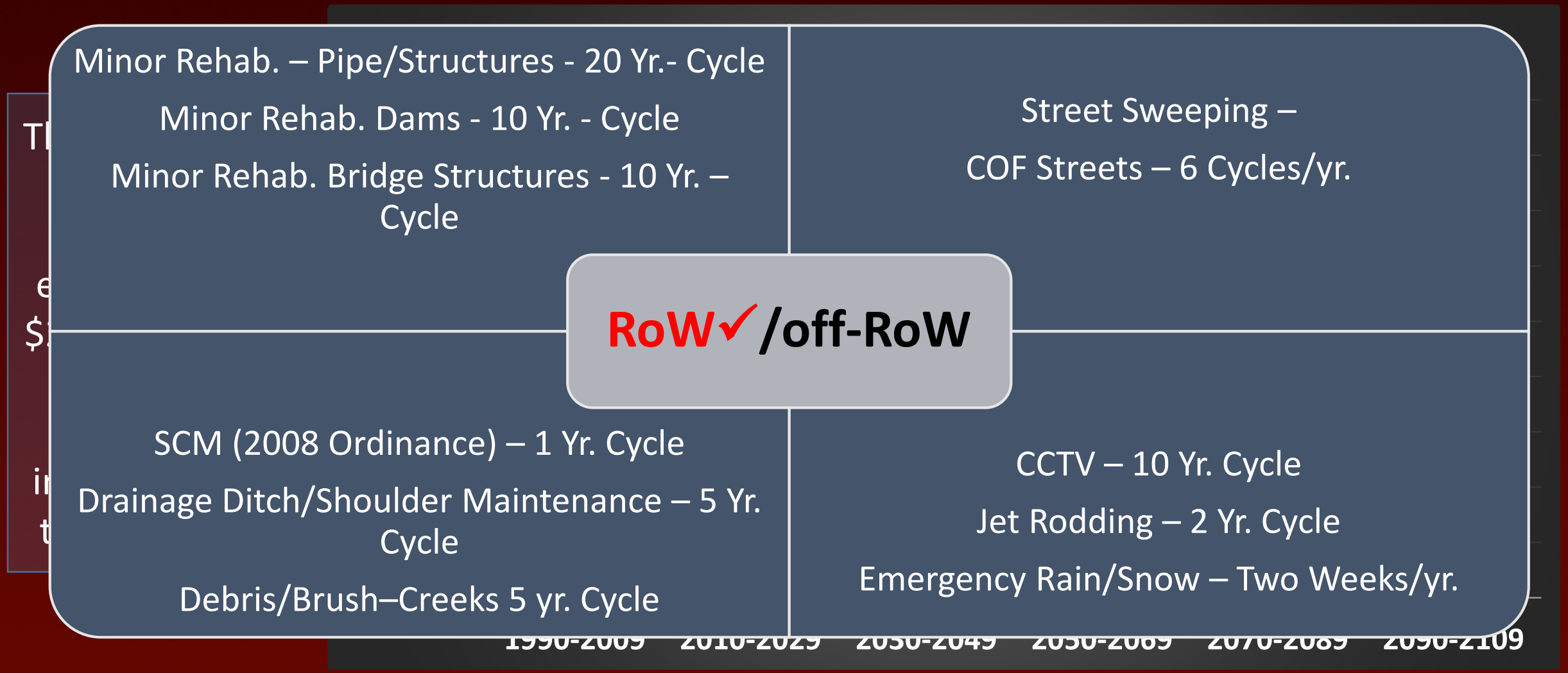
Debris/Brush–Creeks 5 yr. Cycle

CCTV – 10 Yr. Cycle

Jet Rodding – 2 Yr. Cycle

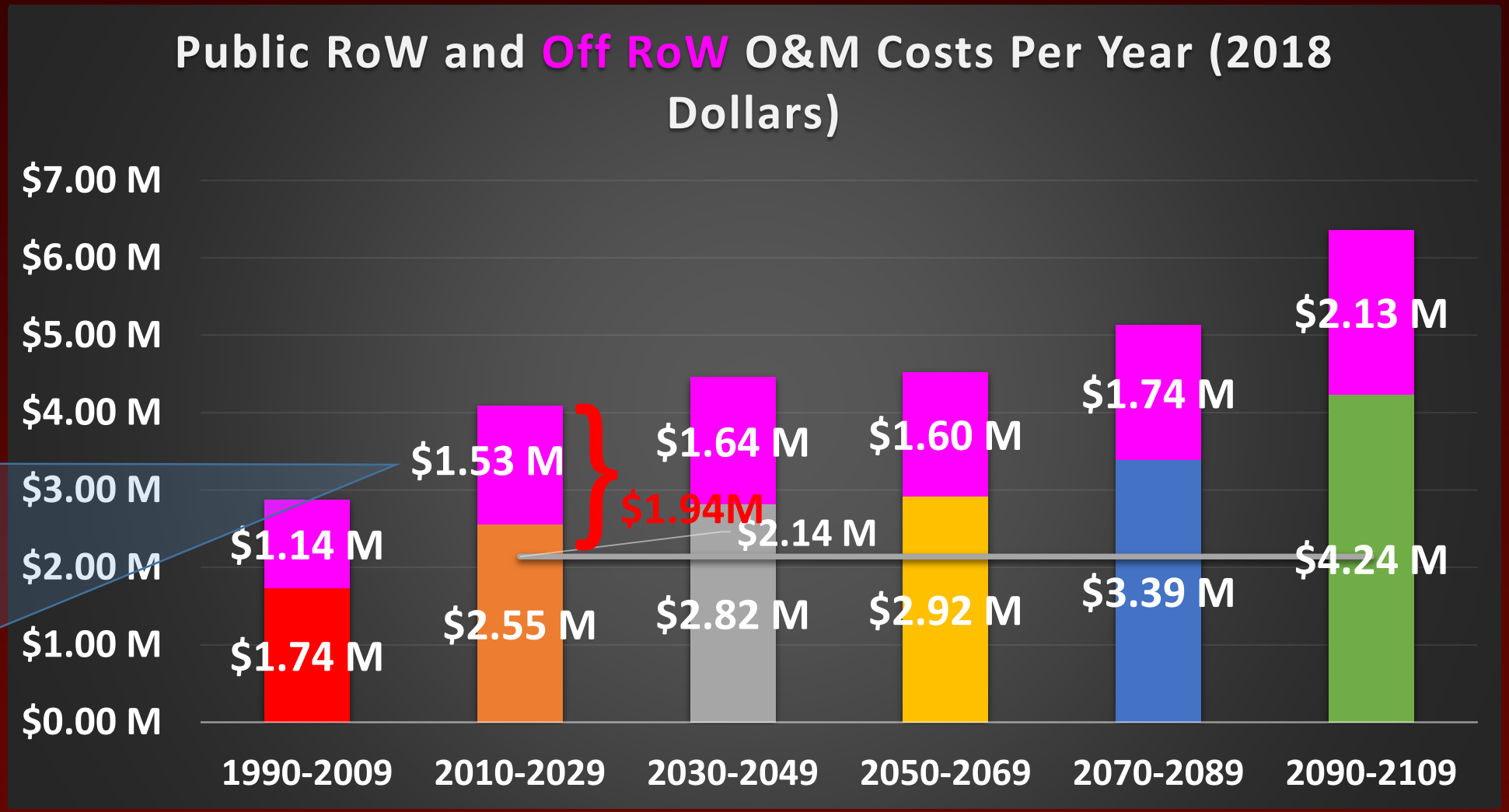
Emergency Rain/Snow – Two Weeks/yr.

Potential Liability – Public RoW O&M Costs

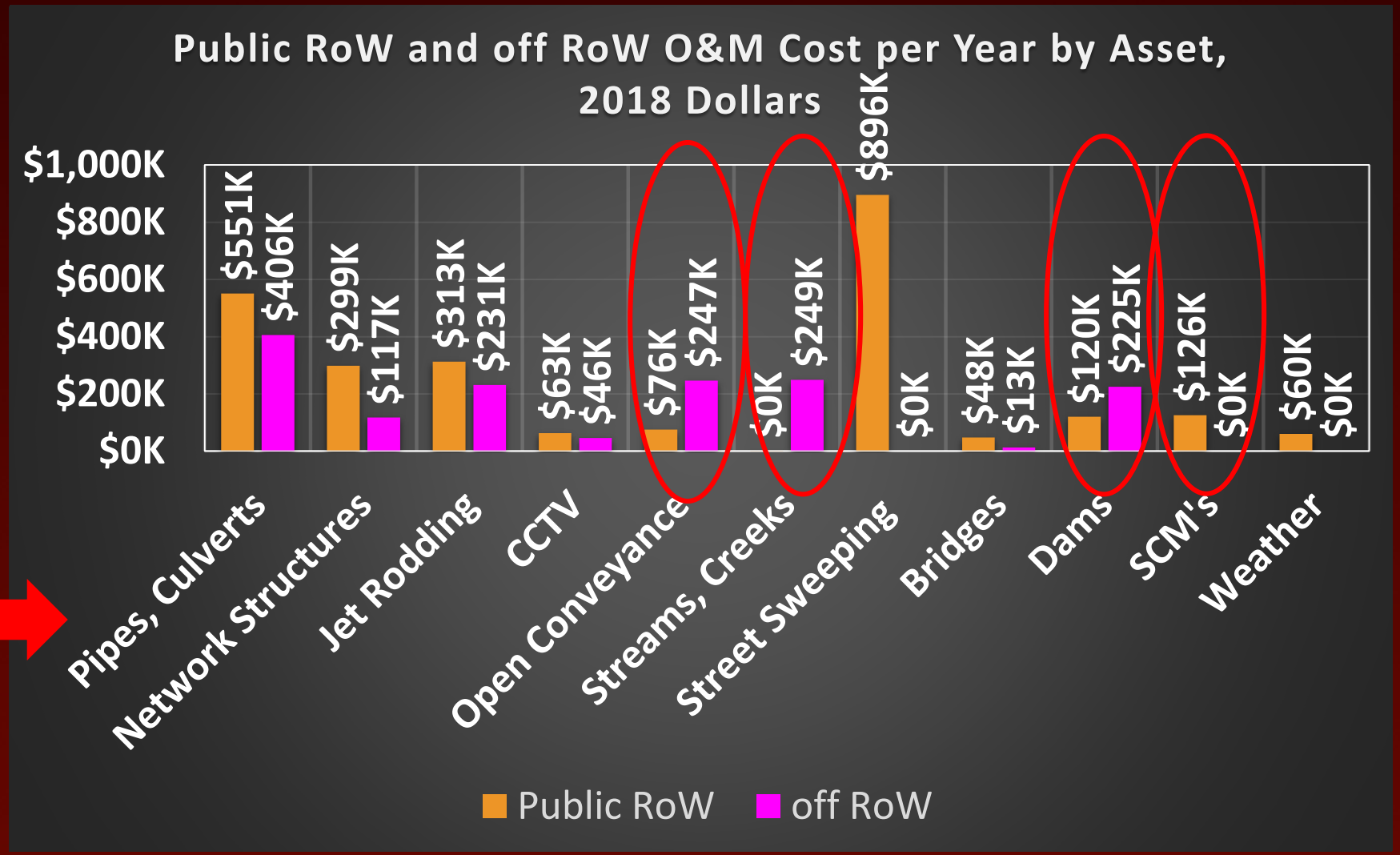


Potential Liability – Public RoW and off RoW O&M Costs

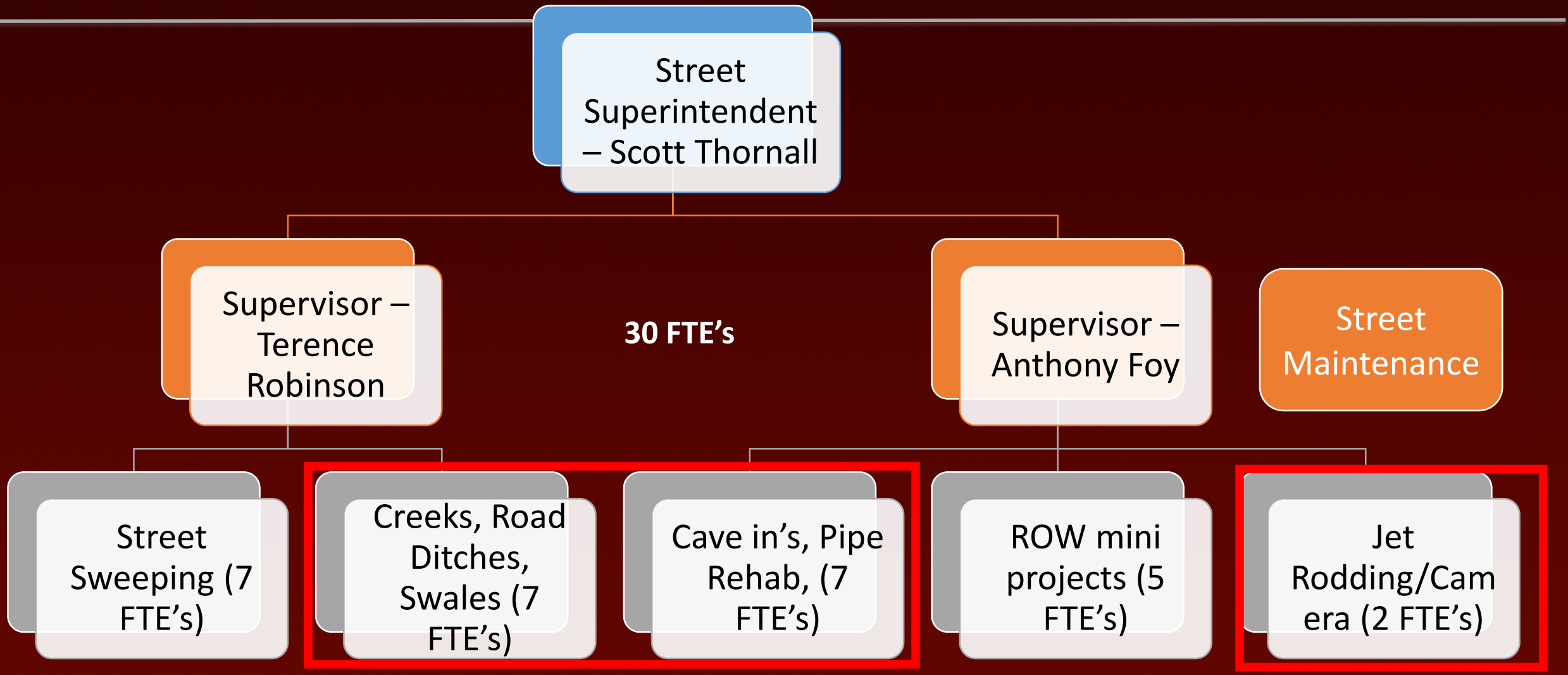
The O&M cost to meet the LOS described is estimated to <u>increase</u> by $1.53M per year for the years 2010-2029 for additional services outside the public RoW



Public RoW and off RoW O&M Cost per Year by Asset, 2010-2029



CoF O&M Staff Resources-Stormwater Maintenance



~Approximately add these three units – minimum 18 FTE's plus equipment for off RoW at LOS

Staff Resources - Comparison with other Municipalities

Municipality	Area (Square Miles)	RoW	Off RoW	FTE's	Square Miles per FTE	CoF % greater workload
Raleigh	145	✓	×	52	2.8	12%
Durham	108	✓	×	45	2.4	24%
Fayetteville	95	✓	×	30	3.2	

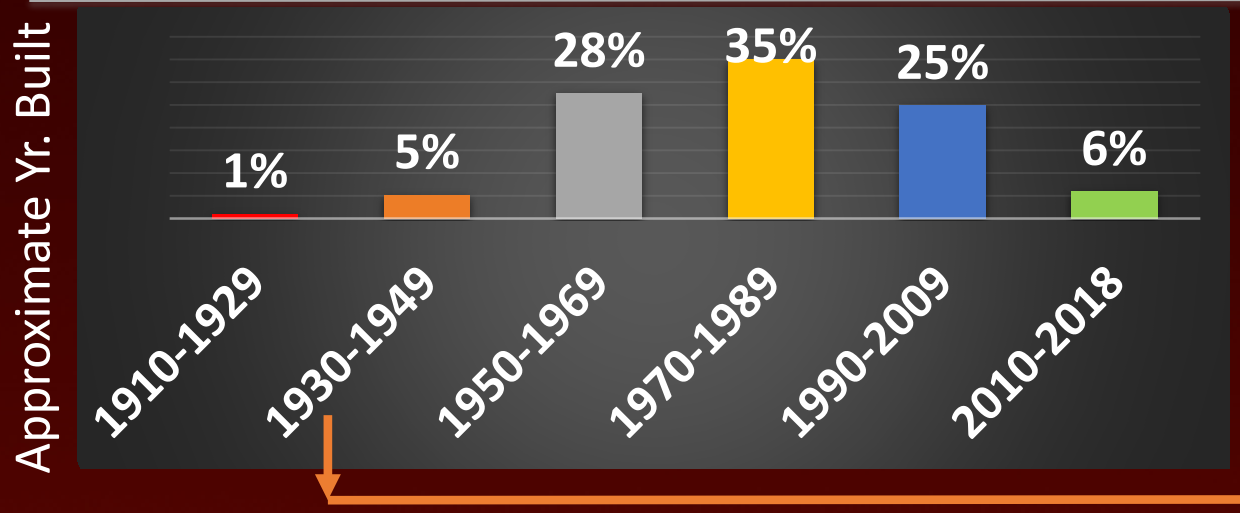
Maintain, repair, replace in the public RoW

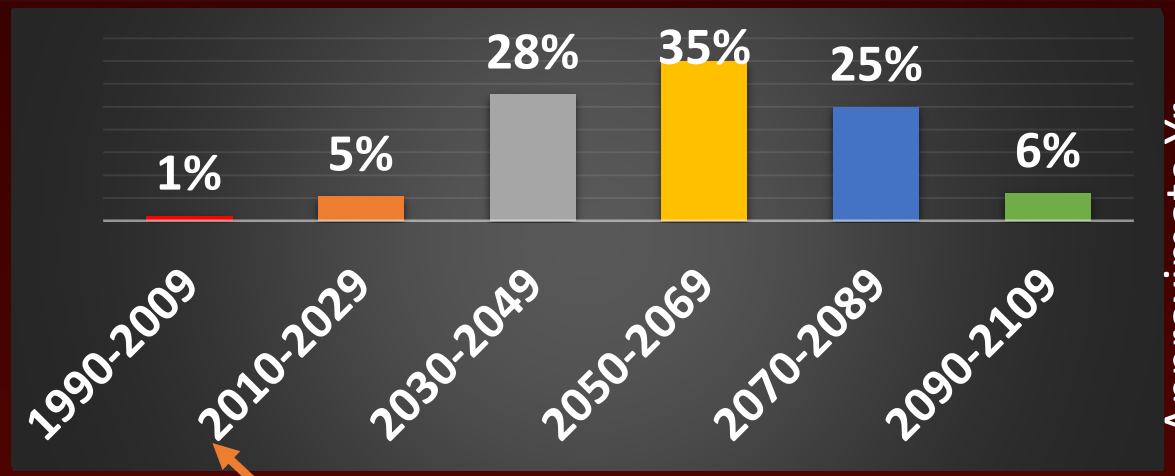
Summary Potential Liability - O&M

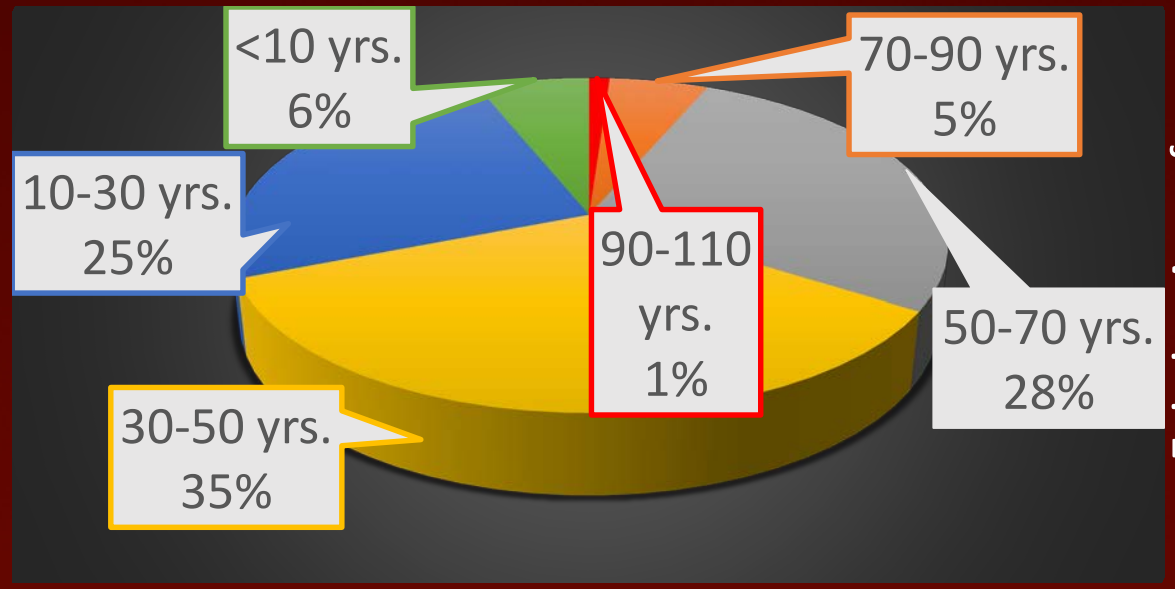
- Public RoW - Significantly understaffed and underfunded ($410K)
- off RoW – Severely understaffed and underfunded ($1.94M)

Potential Liability - What is the Capital Cost to Remove, Replace and Reinstall Stormwater Assets

When will we have to replace it (condition)?







Pipe and Network Structures have 80 year life span

Capital Cost to Replace – Level of Service Core Responsibilities – RoW

Full Replacement– Pipe/Structures - 80 Yr.- Cycle

Major Dams (RoW)– 120 yr. Cycle (1 every 20 years)

Minor Dams (off RoW) – 225 yr. Cycle (4 every 20 years)

Bridge Structures – 95 Yr. Cycle (1 every 5 years)

Street Sweeping – Equipment Replacement

RoW✓/off-RoW

SCM (2008 Ordinance) – 20 Yr. Cycle

Drainage Ditch/Shoulder – 20 Yr. Cycle

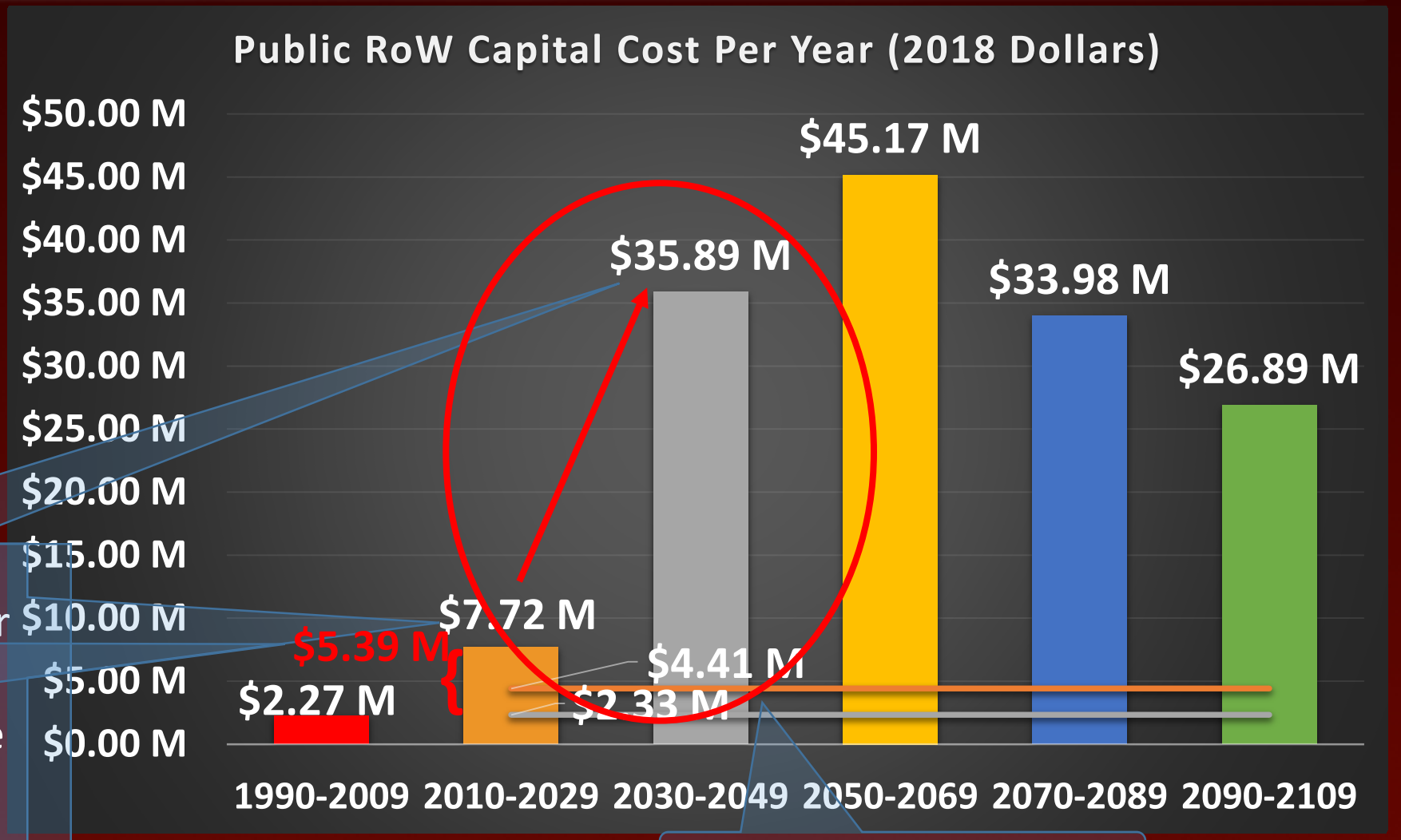
Creeks 400 yr. Cycle (5% in 20 Yrs.)

CCTV – Equipment Replacement

Emergency Prep – NA

Potential Liability – Public RoW Capital Costs

Current Age (yr)	Max. Lifespan	
90-110	1990-2009	1%
70-90	2010-2029	5%
50-70	2030-2049	28%
30-50	2050-2069	35%
10-30	2070-2089	25%
<10-proj.	2090-2109	12%



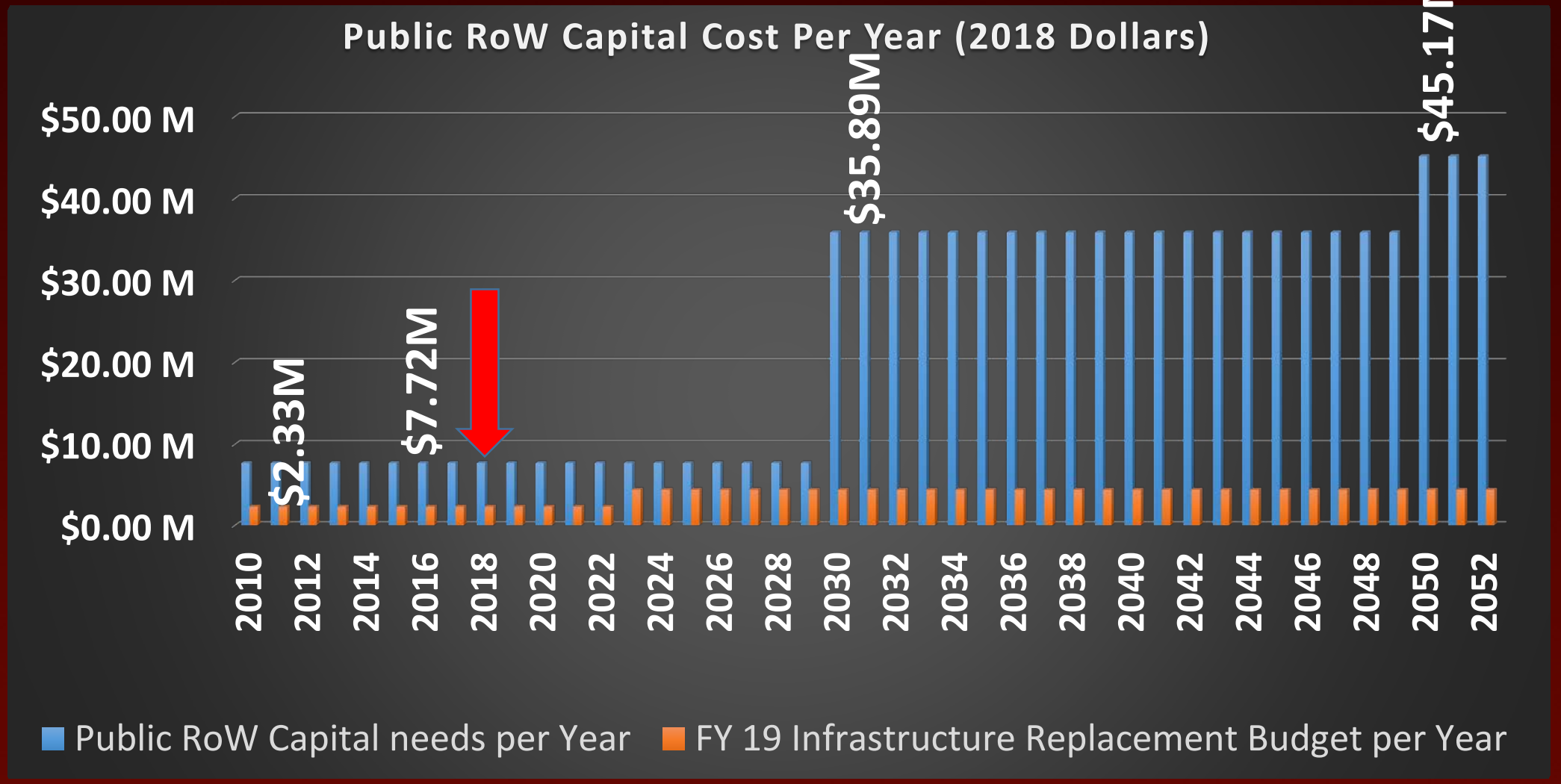
The capital needs will increase to $35.89M/yr. by the year 2030 and $45.17M/yr. by 2050.

We are currently $5.39M/yr. in the deficit for capital need

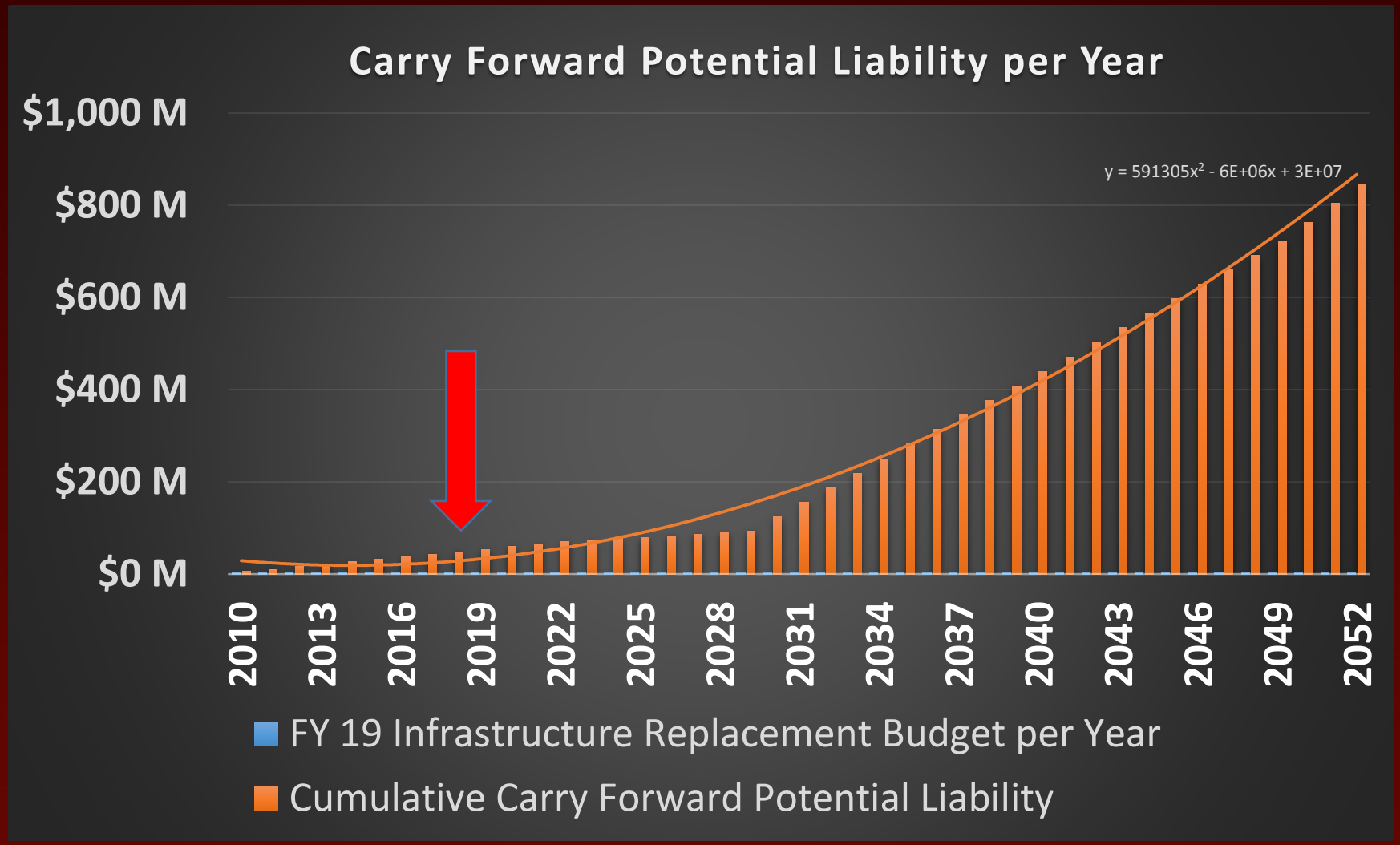
28% of the public infrastructure will have reached its lifespan by this time.

Watershed studies

Potential Liability – Public RoW Capital Costs (2010-2052)



Potential Carry Forward Liability – Public RoW Capital Costs (2010-2052)



Potential Liability – RoW ✓ and off RoW ✗ Capital Costs

Full Replacement– Pipe/Structures - 80 Yr.- Cycle

Major Dams (RoW)– 120 yr. Cycle (1 every 20 years)

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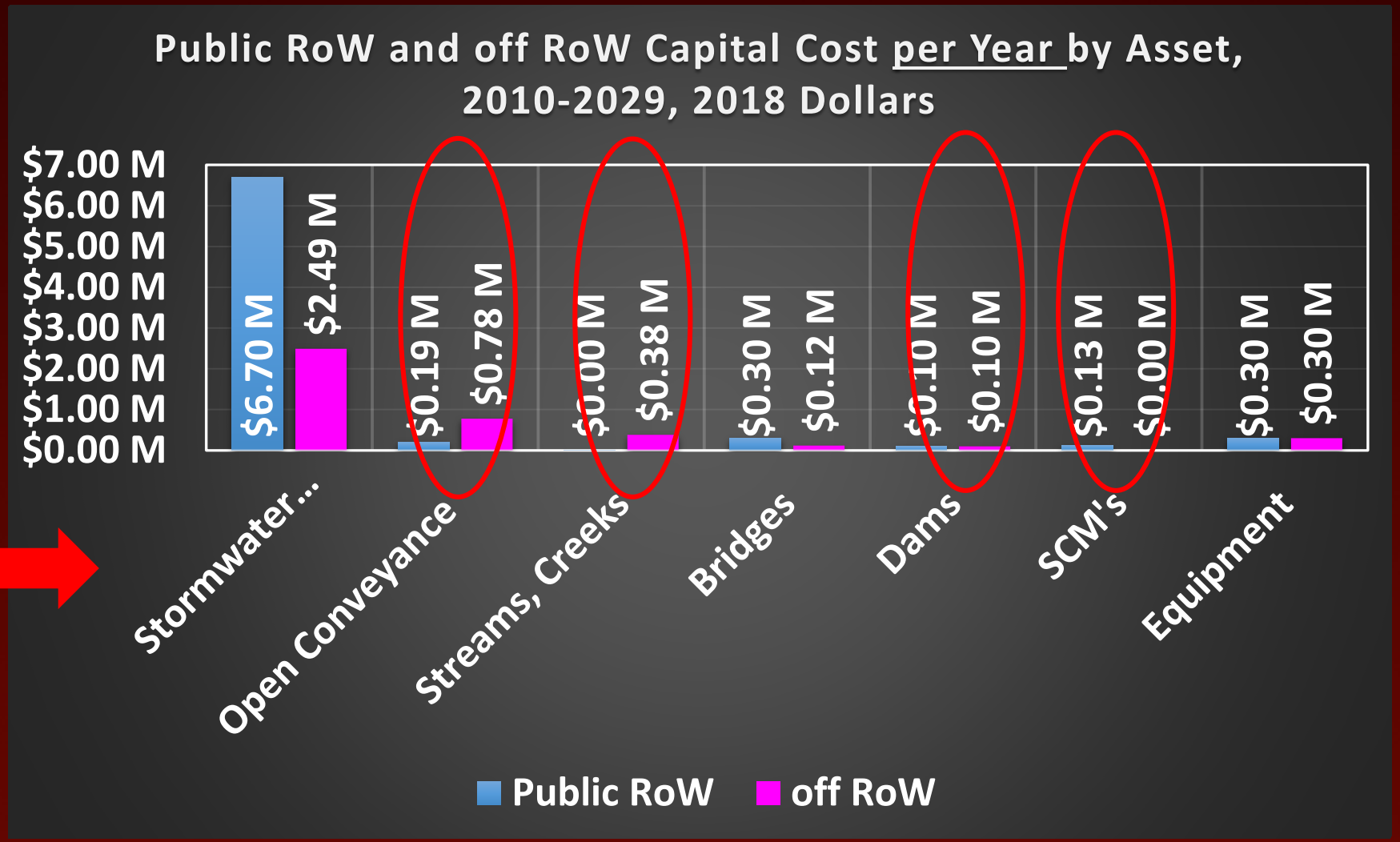
Creeks 400 yr. Cycle (5% in 20 Yrs.)

CCTV – Equipment Replacement

Emergency Prep – NA

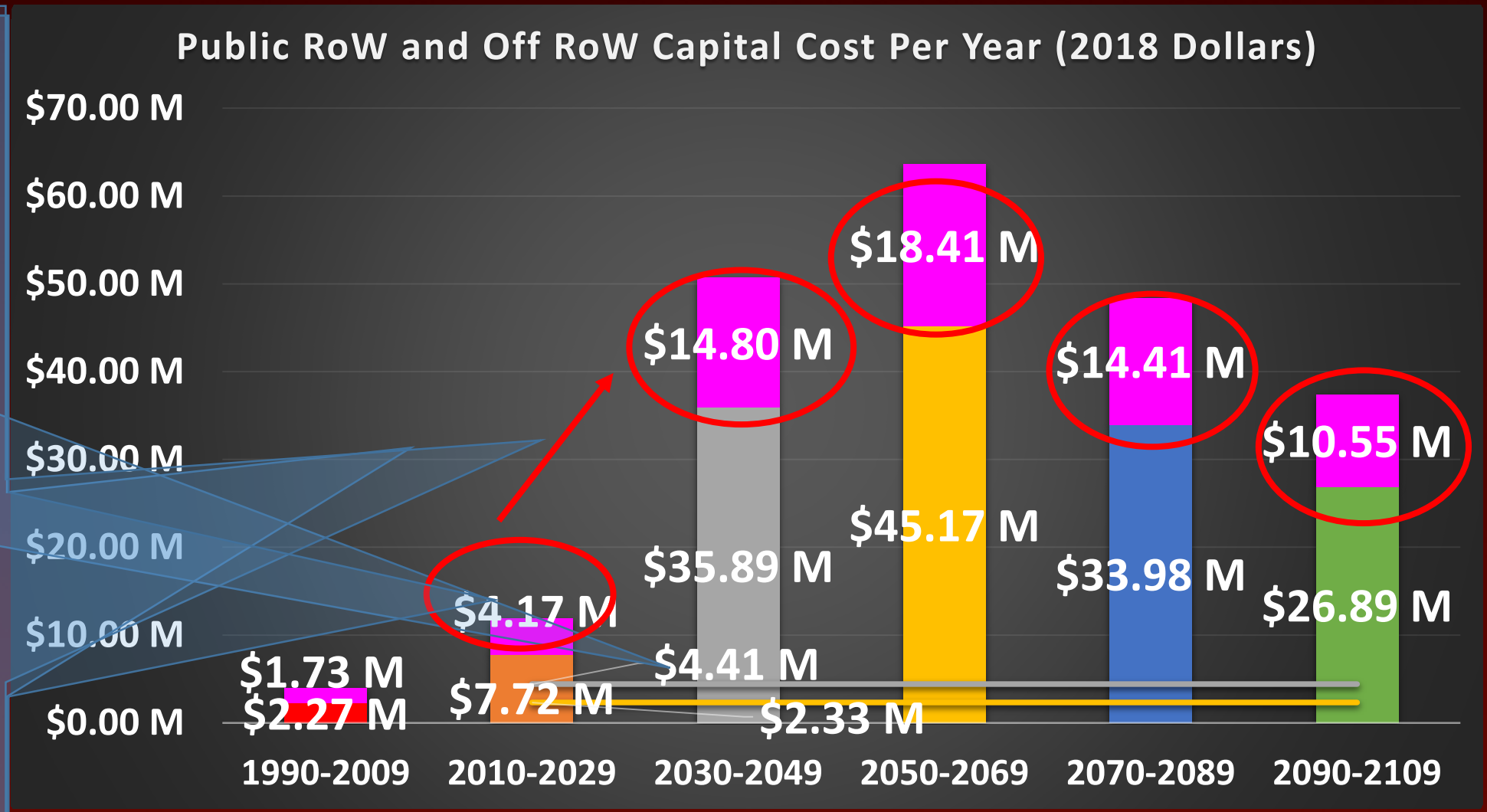
Public RoW and off RoW Capital Cost per Year by Asset, 2010-2029



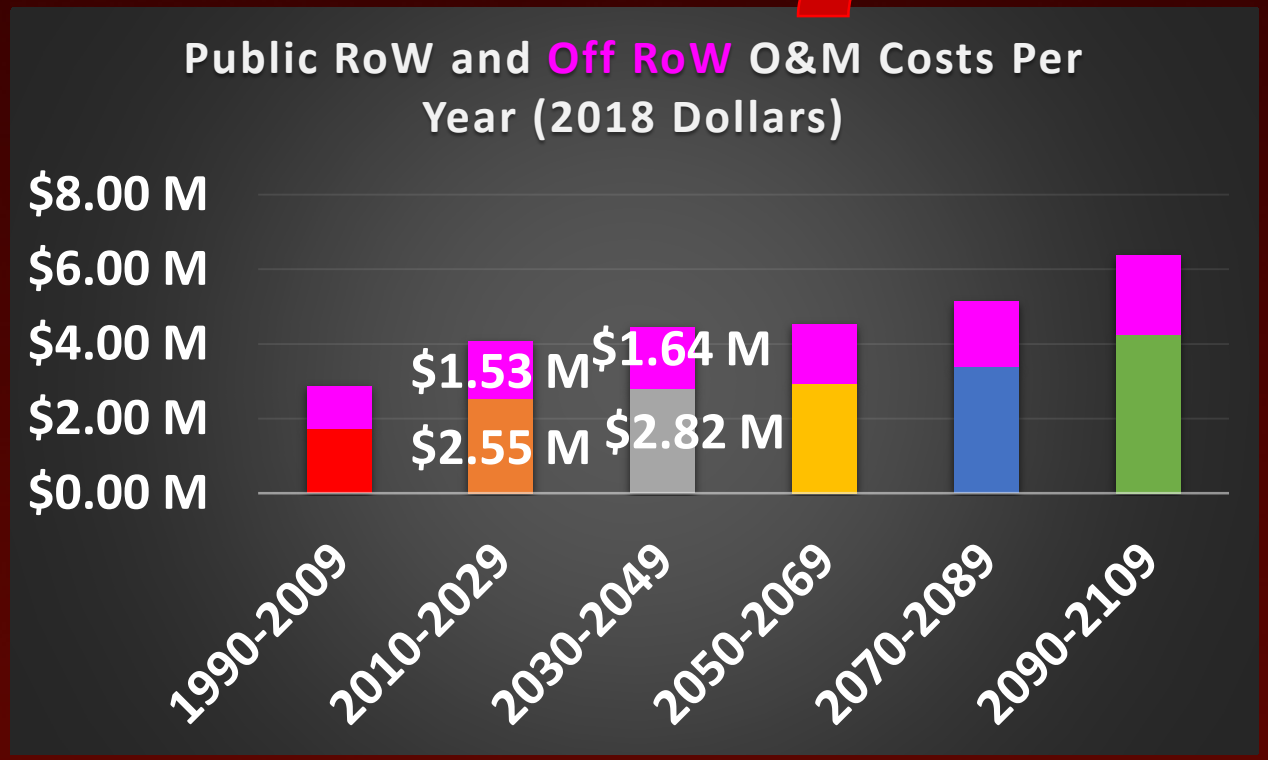
Summary

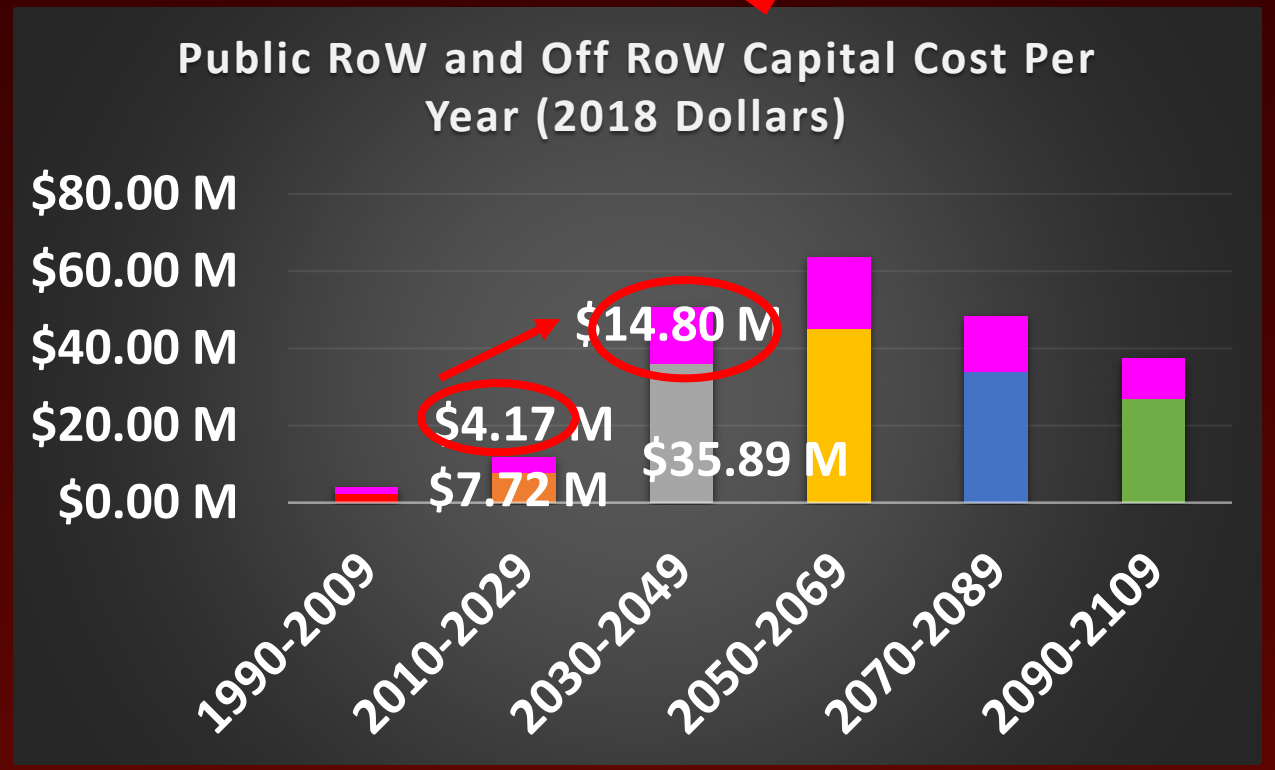
While this is a high-level analysis, our current data indicates that ~28% of our infrastructure was built between 1950-1969 and ~35% between 1970-1989. This rapid change in growth will ultimately create a significant need as this infrastructure matures to maximum life.

While $1.53M may seem significant to take on additional O&M services for 'off RoW' services, it presents a substantial additional liability of $4.17M/yr. of capital needs for existing years and upwards of ~$15M/yr. in future years.

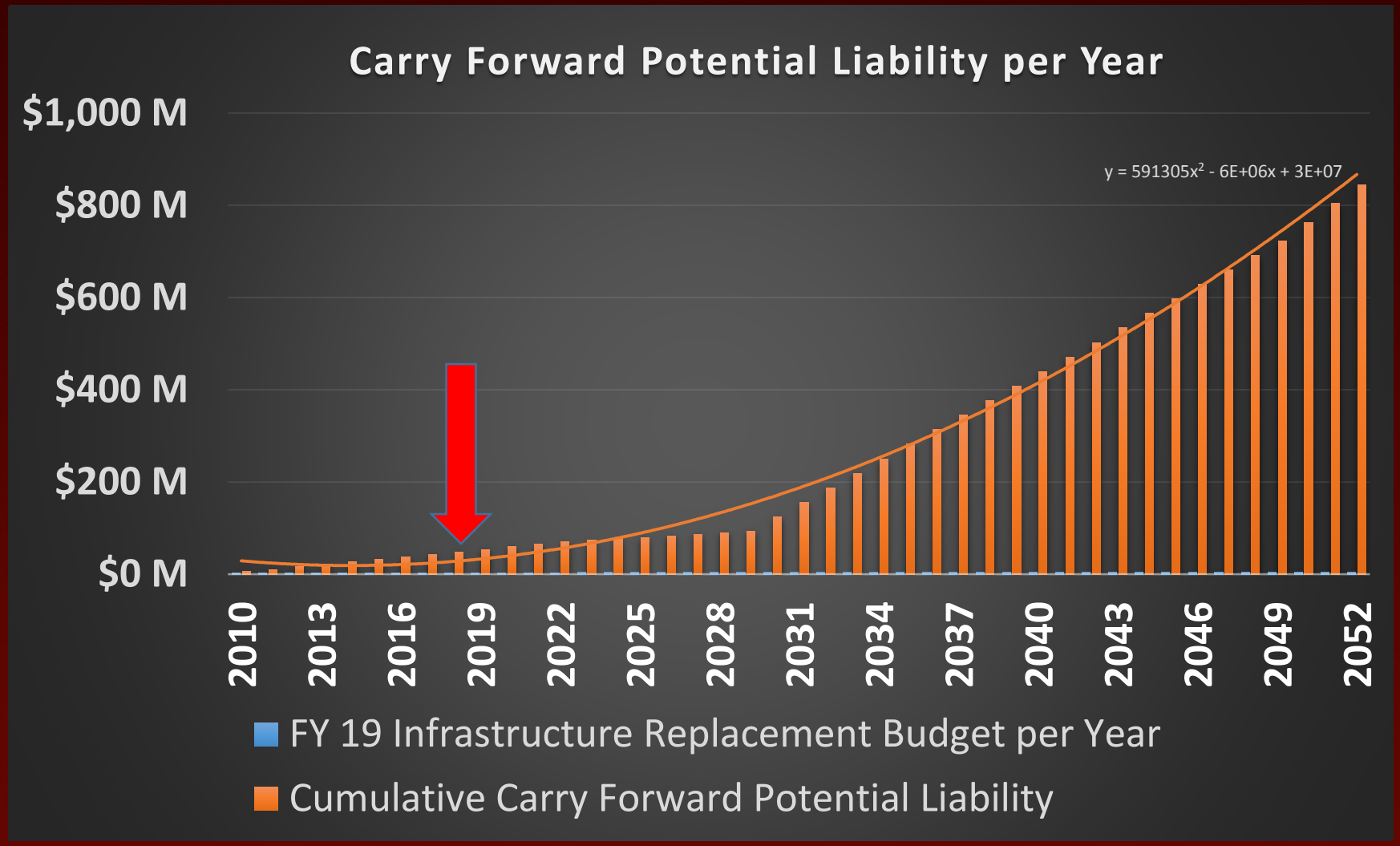


Summary


Public RoW and Off RoW O&M Costs Per Year (2018 Dollars)
$8.00 M
$6.00 M
$4.00 M
$2.00 M
$0.00 M
$1.53 M
$2.55 M
$1.64 M
$2.82 M
1990-2009
2010-2029
2030-2049
2050-2069
2070-2089
2090-2109


Public RoW and Off RoW Capital Cost Per Year (2018 Dollars)
$80.00 M
$60.00 M
$40.00 M
$20.00 M
$0.00 M
$14.80 M
$4.17 M
$7.72 M
$35.89 M
1990-2009
2010-2029
2030-2049
2050-2069
2070-2089
2090-2109

Potential Carry Forward Liability – Public RoW Capital Costs (2010-2052)



City of Fayetteville North Carolina

Options for Private Properties

What do Other Municipalities do?

Drainage Assistance Program for off-RoW

- Usually for minor projects
- Cost Share
- Municipality portion is funded through CIP process
- Public contribution of runoff
- Priority based
- Projects are approved by Stormwater Board

What do Other Municipalities do?

City	Allocated Funds from CIP	Cost Share	Limits	Priority Based
Raleigh	$1.25M	100	No Cap Indv. Cap per Project	✓
Durham		80/20	$25K per property	✓
Winston Salem		70/30	$35K per property	✓
Cary		50/50		✓

Summary - Legal

Issues/Analysis

- Maintain, repair, remove, replace: public RoW ✓, off RoW ✗
- Inconsistent application of our understanding this obligation.
- CoF ordinance will benefit from additional clarity regarding this issue.

Staff Recommendations

- City Council adopts revisions to the ordinance and approves policy changes to future plat and easement requirements.

Options

- Endorse revisions to the ordinance and approve policy changes to future plat and easement requirements.
- Do not endorse revisions to the ordinance, do not approve policy changes and provide further direction to the City Manager.

Summary - Resources

Issues/Analysis

- Significantly understaffed and underfunded to support O&M obligations in the public RoW within a consistent and defined LOS.
- Severely understaffed and underfunded to support O&M demands off-RoW.
- Any additional extension of our core responsibilities will result in substantial capital liability.

Staff Recommendations

- CoF staff perform O&M only within the public RoW.
- CoF staff develop a 'Drainage Assistance Program' to address off RoW issues for future Council review and guidance.

Options

- Endorse a policy for staff to perform O&M only within the public RoW.
- Direct CoF staff to develop a 'Drainage Assistance Program' for further Council review and guidance.
- Do not endorse policy changes, do not direct staff to develop a 'Drainage Assistance Program' and provide further direction to the City Manager.

Questions?

Sheila Thomas-Ambat
Interim Public Services Director, PE, CCM, CFM

Alicia Young
Assistant City Attorney

Team Members: Kristoff Bauer, Giselle Rodriguez, John Larch, Scott Thornall, Kecia Parker, Terence Robinson