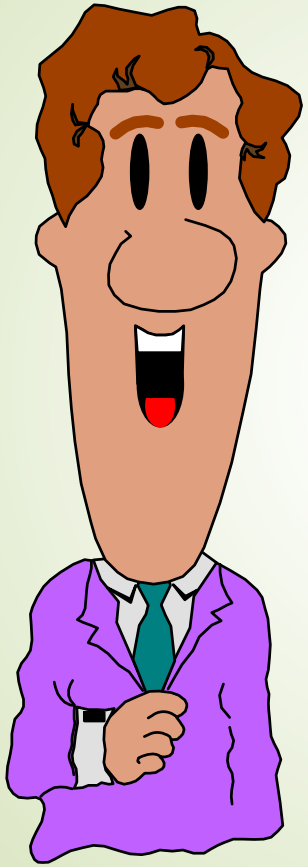
How 2000 US Cities Solved Road Maintenance's Most Annoying Problem

Andy Reese
Principal Engineer
Amec Foster Wheeler
A Wood Company

wood.

That problem?



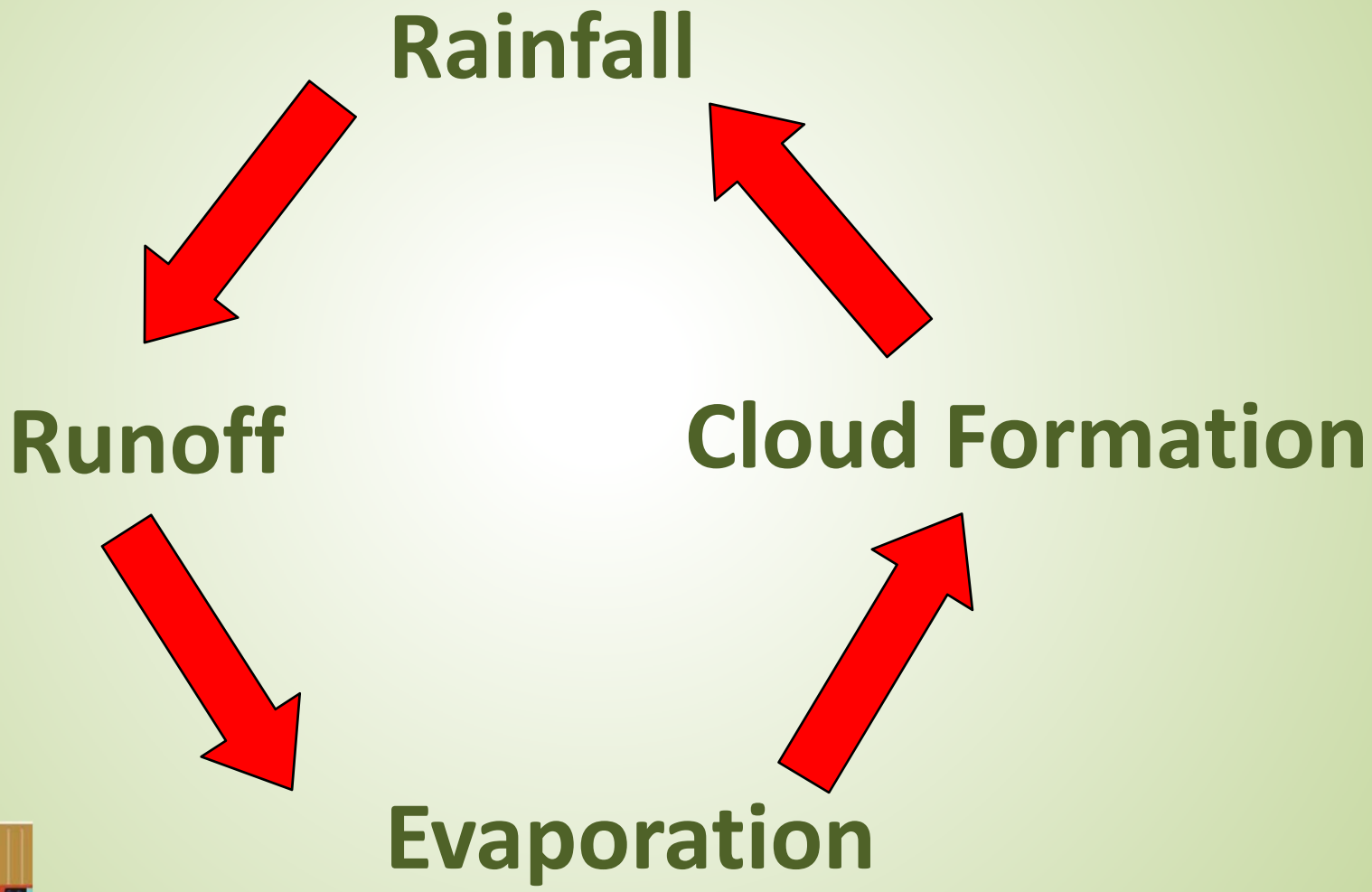
Stormwater and roads are intimately connected but often not very compatible…

wood.


last


last

The hydrologic cycle



The Hydro-illogical Cycle

Flooding

Procrastination

Planning

Panic

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Its not just the road flooding driver for local stormwater programs of course…

- ✓ **Flooding**
- ✓ **Aging infrastructure**
- ✓ **Expanded system responsibilities**
- ✓ **Reduced national or state assistance**
- ✓ **Development pressures**
- ✓ **Erosion of channels & creeks**
- ✓ **Water quality & ecology**
- ✓ **Regulatory mandates and/or lawsuits**
- ✓ **Quality of life, aesthetics and TBL**
- ✓ **Preservation of property value**
- ✓ **Drinking water protection and replenishment**
- ✓ **Climate change**
- ✓ **Drought**

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The Hydro-illogical Cycle

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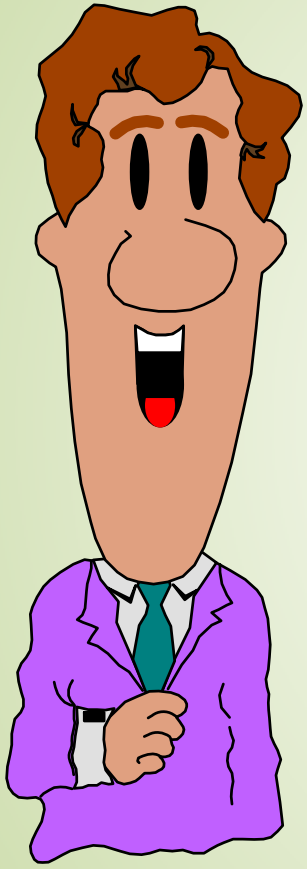
Panic

Procrastination

Planning

wood.



Of course its not quite that easy right… or anyone could do it.

So in the 1980's a few ideas began to gain traction with US local public works leaders

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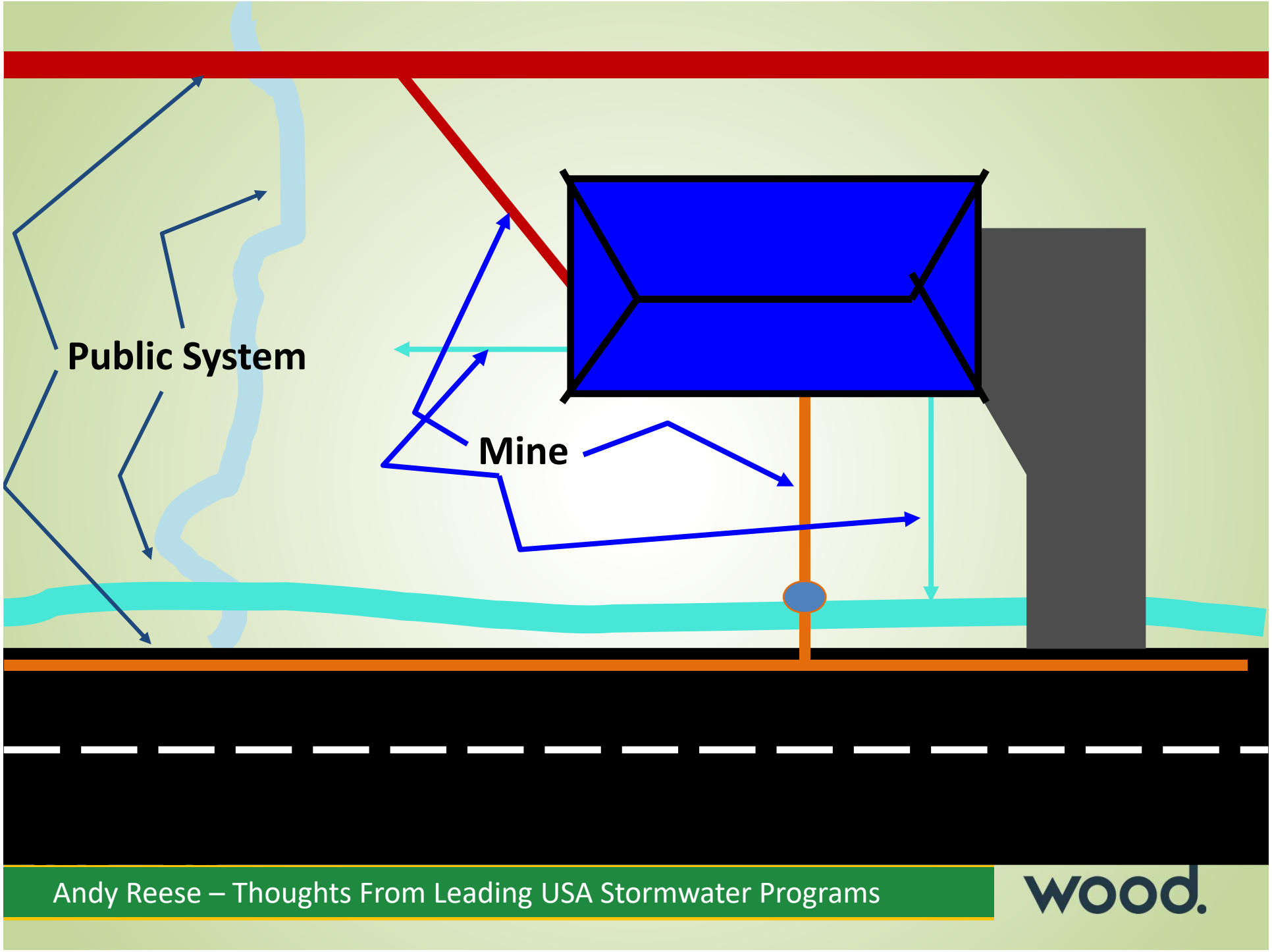
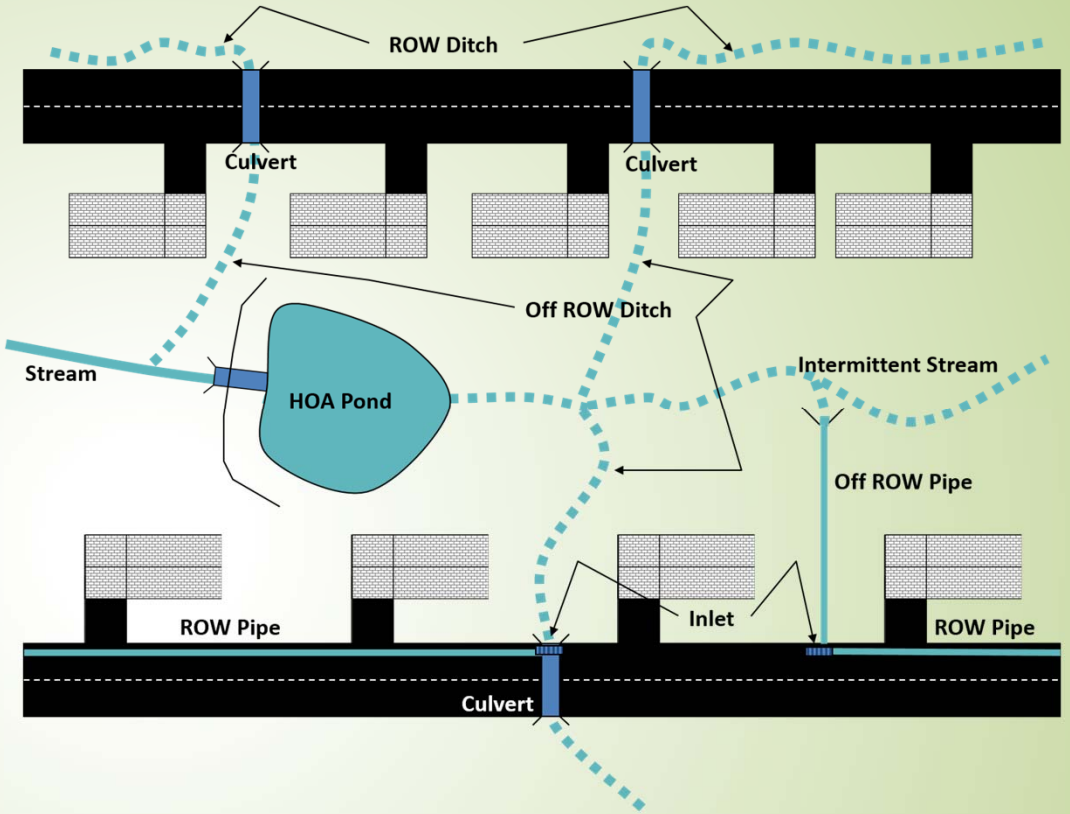

Public System
Mine

Stormwater is a connected public system

System, not Parcel or ROW, Thinking

- I own and/or operate a stormwater system.
- It starts from the first time public water enters my system.
- I begin to transform my program with balanced EOS, TOS and LOS policies



EOS - Where do I go?
TOS - What do I do when I get there?
LOS - How well do I do it?

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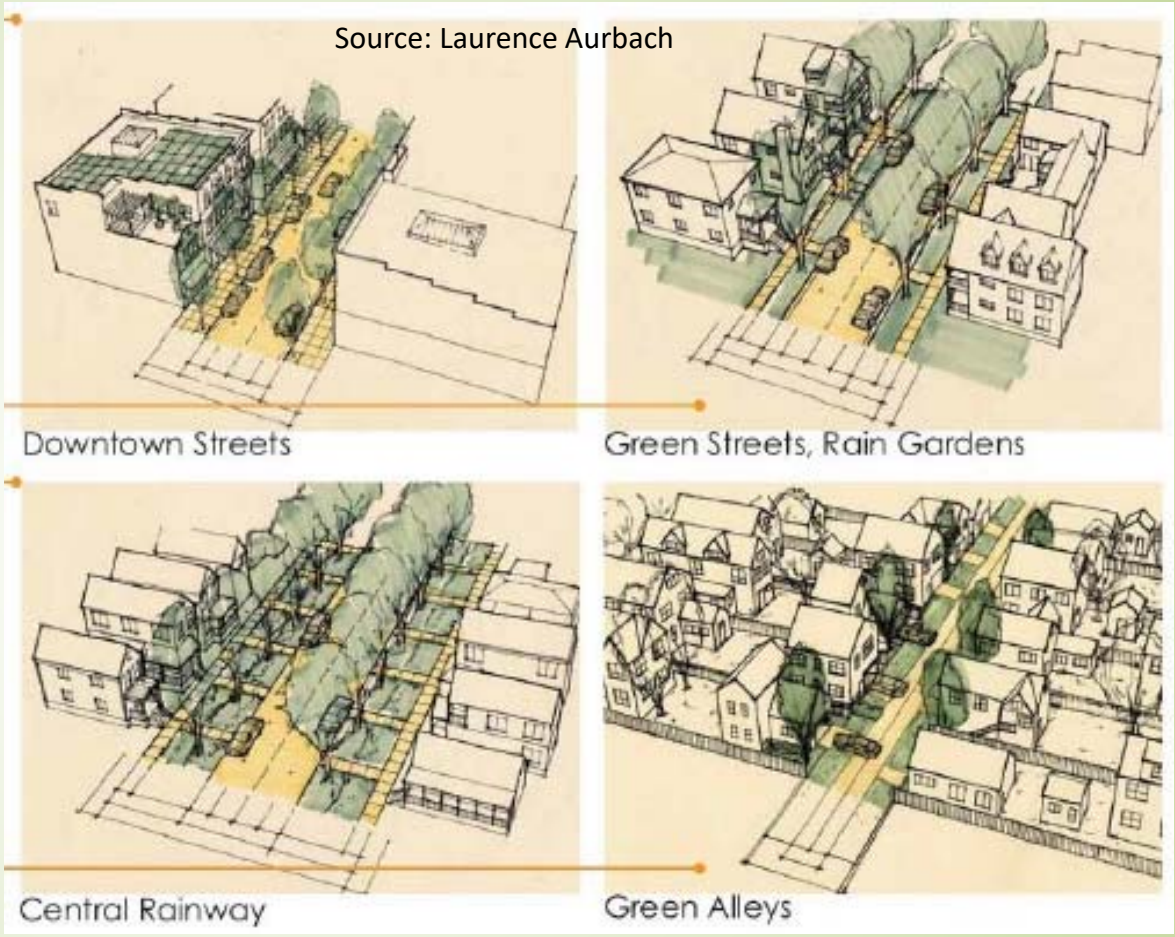
New stormwater concepts cause lines to begin to blur

ROW as a Shared Resource

- The ROW is not a boundary it is a legal line whose use can be redefined.
- New WSUD development concepts blur the ROW line.
- Stormwater as an attractive resource.



Roadways account for >1/3 of the runoff and far more % pollution

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There is another “driver”

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"The rise of the Millennials"
TASTE THE LOVE
ORGANIC
FAIR TRADE
LOCALLY ROASTED
BEAUTIFULLY CRAFTED

WSUD – hmmm… Organic? Check. Fair Trade? Check.
Locally Roasted? Check. Beautifully Crafted? Check.

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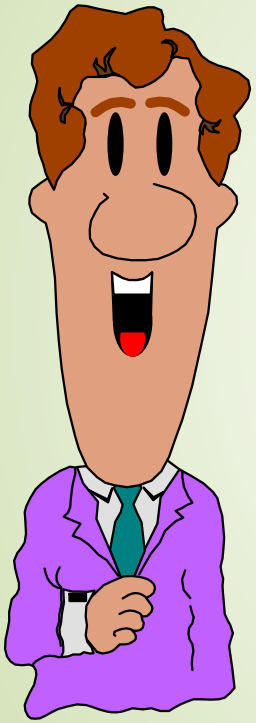
USA Today

- Major high-demand market shift
- For millennials and retiring boomers
- Reclaiming downtown parcels
- Small 1 to 2 story SFR - walkable
- With green features

Key Ideas



1. Stormwater is a system like water and wastewater

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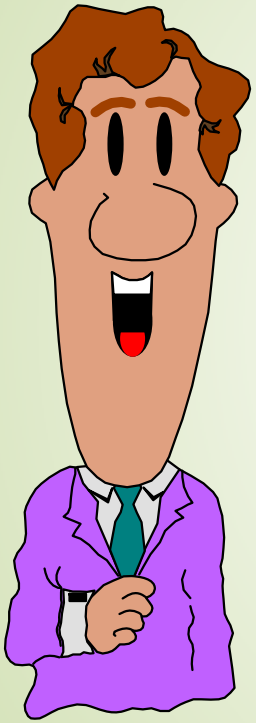
Key Ideas



1. Stormwater is a system like water and wastewater
2. Stormwater should be run in a comprehensive business-like manner with a business plan like…

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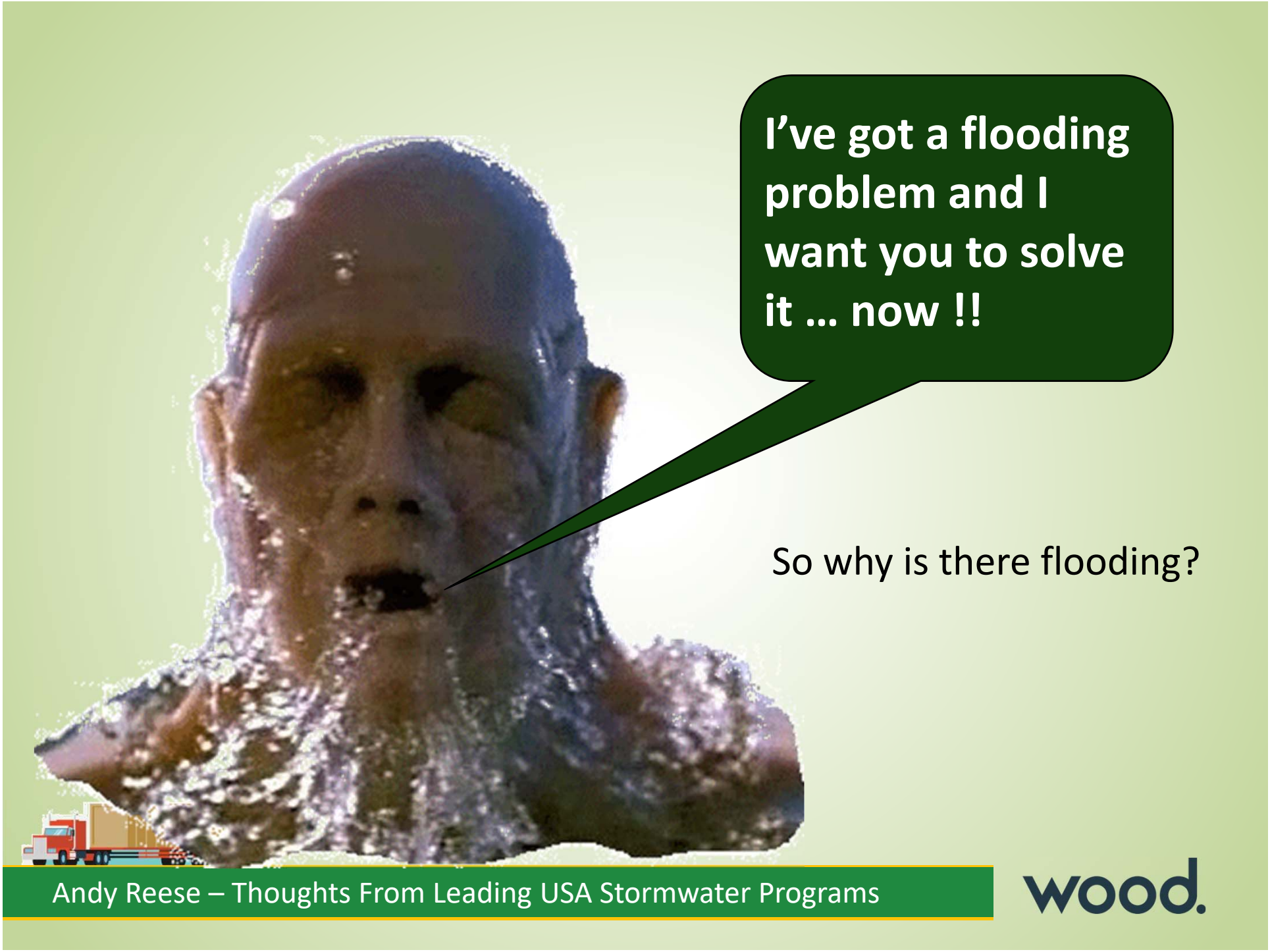
I've got a flooding problem and I want you to solve it … now !!
So why is there flooding?
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Flooding Problems

1. Clogged or damaged
2. Building location
3. Undersized system
4. More runoff
5. More rainfall

1. Knowledge/Maint
2. Incomplete regs
3. Poor design
4. No impact assessment
5. Climate/Big Storm

1. Authority structure
2. Master planning
3. Funding

Little political support
Little public knowledge

Joint vision & direction

We have found this sort of “5 Whys” logic development can serve as a basis for a structuring the program part of a business plan for stormwater management and this articulated set of needs drives the solutions.

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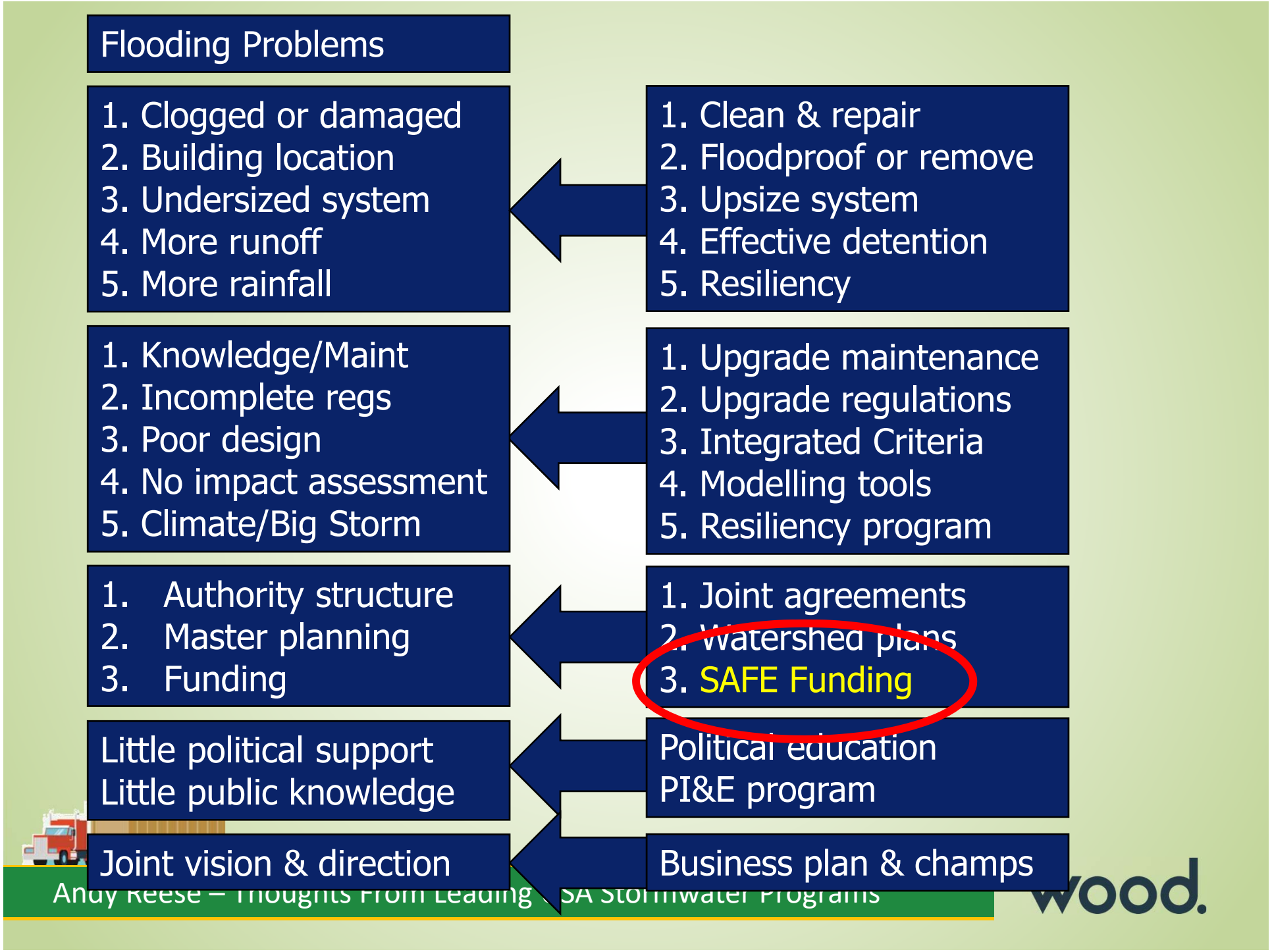
Flooding Problems
1. Clogged or damaged
2. Building location
3. Undersized system
4. More runoff
5. More rainfall
1. Clean & repair
2. Floodproof or remove
3. Upsize system
4. Effective detention
5. Resiliency
1. Knowledge/Maint
2. Incomplete regs
3. Poor design
4. No impact assessment
5. Climate/Big Storm
1. Upgrade maintenance
2. Upgrade regulations
3. Integrated Criteria
4. Modelling tools
5. Resiliency program
1. Authority structure
2. Master planning
3. Funding
1. Joint agreements
2. Watershed plans
3. SAFE Funding
Little political support
Little public knowledge
Political education
PI&E program
Joint vision & direction
Business plan & champs
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SA Stormwater Programs
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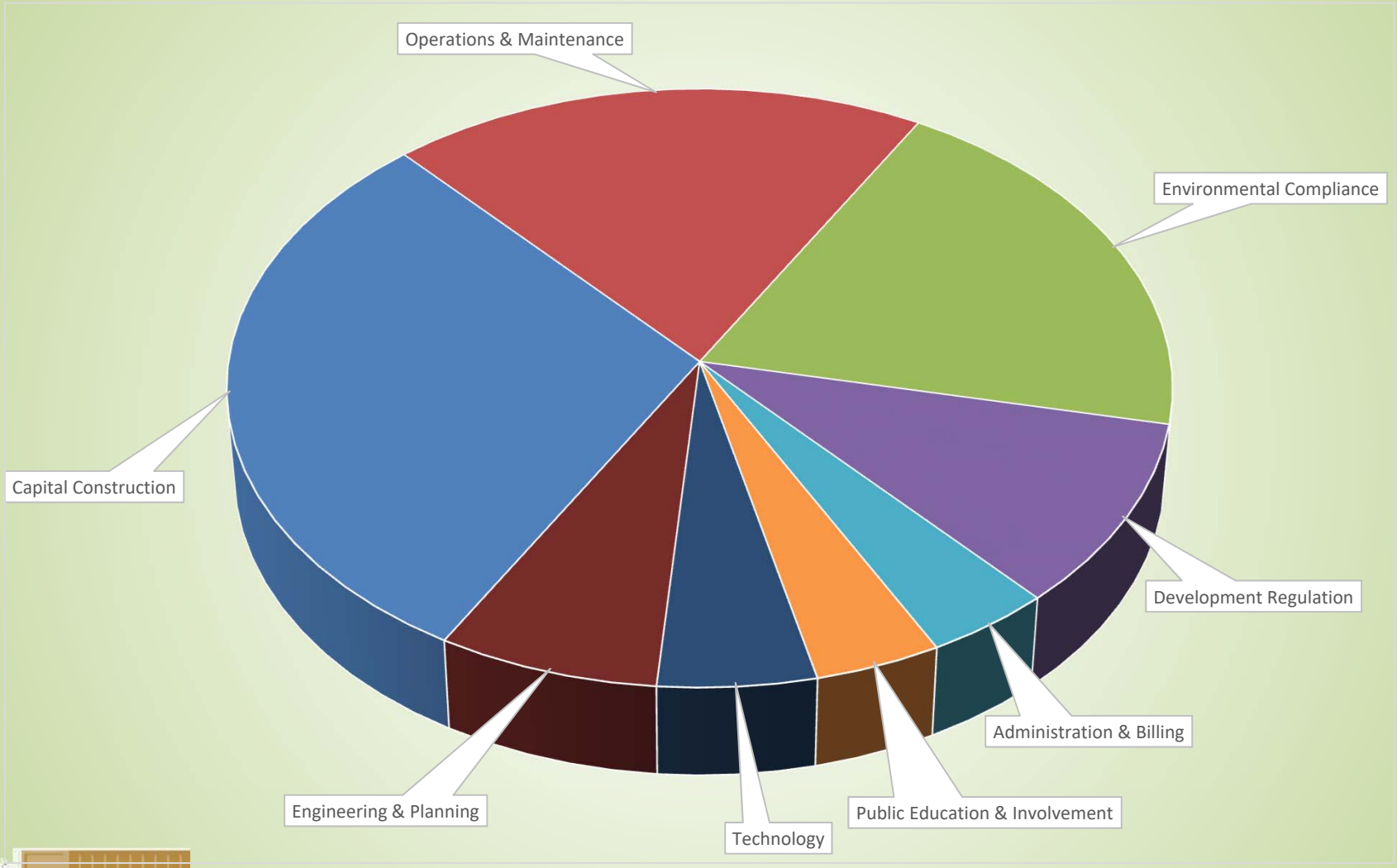
The “Business” of Stormwater



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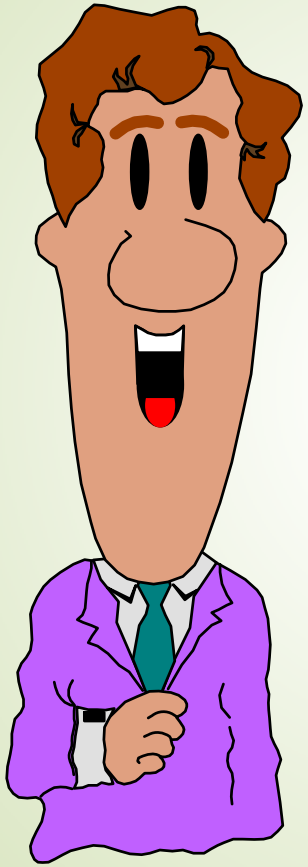

OK get to the point.

What does that cost and how do we pay for it?

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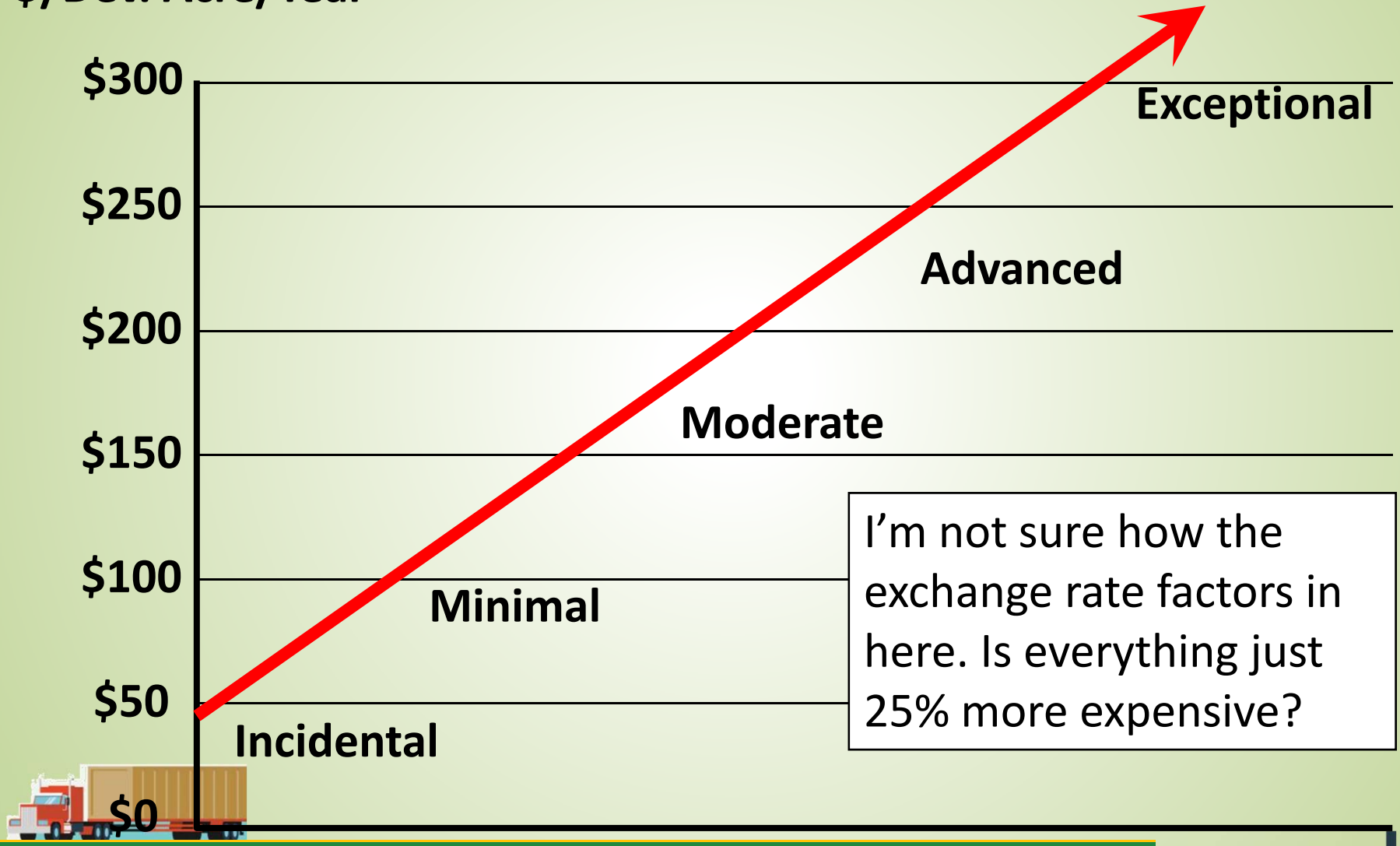
Stormwater Program Costs

Based on Data From ≈100 US Cities



I'm not sure how the exchange rate factors in here. Is everything just 25% more expensive?

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>200 “funding” methods and most fall into four buckets:

- **Efficiency** – technological, operational, financial changes that reduce overall costs – ***same program costs less***
- **Resources** – others perform some of your program or provide non-monetary goods – ***same program but I do less***
- **Money** – one-time, limited, dependent on a trigger – ***some help some of the time***
- **Revenue** – regular, predictable, budgeted, flow of financial resources – ***lots of help all the time***

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Adopt-a-Stormdrain

NO DUMPING!
$1 OWES TO STARBUCKS


Windows
Prudential
SHKOSH
UPS
Sports Illustrated

Building Blocks for Funding and Financing

PPP Mgmt.	User Fee	Volunteers	Fines
Impact Fee	Bonding	General Fund	Spec. Tax Assessment
Shared Costs	Inspection Fees	Grants	Special Sales Tax

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The question we always come to is: "How much of this can you cover with efficiencies, resources & money?"

1. Administration
- General Administration
- Gen Prog Planning & Dev
- Interlocal Coordination
- Grants Program

2. Billing And Finance
- Billing Operations
- Customer Service
- Financial Management
- Indirect Cost Allocation
- General Government Support

3. Public Ed & Involvement
- Public Awareness
- SW Qual Ed & Reporting
- Public Involvement
- Citizen's Advisory Group
- Non-profit Integration
- Media Relations
- Risk Communications

4. Technical Support
- GIS Applications
- Database Management
- Mapping & Imagery
- General Data Collection
- Web & Customer Support

5. Engineering & Planning
- Des Criteria, Stds And Guidance
- Field Data Collection
- Quantity Master Planning
- Quality Master Planning
- Design, Field & Ops Engr
- Retrofitting For Water Quality
- Hazard Mitigation
- Zoning Support
- Multi-objective Planning Support

6. Operations & Maintenance
- General Maintenance Mgmt
- General Routine Maintenance
- General Remedial Maintenance
- Emergency Response Maint
- Infrastructure Management
- Public Assistance

7. Capital Improvements
- Major Capital Improvements
- Minor Capital Improvements
- Land, Easement, And ROW
- Public-Private Partnerships

8. Regulation And Enforcement
- Code Dev & Enforcement
- General Permit Administration
- Drainage Sys Insp & Reg
- Zoning & Land Use Reg
- Special Inspection Programs
- Flood Insurance Program
- Multi-Obj Floodplain Mgmt
- Erosion Control Program
- Pest, Herb & Fertilizer
- Used Oil & Toxic Materials
- Spill Response & Clean Up
- Illicit Con & Illegal Dumping
- Groundwater & Drinking Water
- Watershed Assessment & TMDL
- Septic & I&I Program
- Industrial Program
- Monitoring

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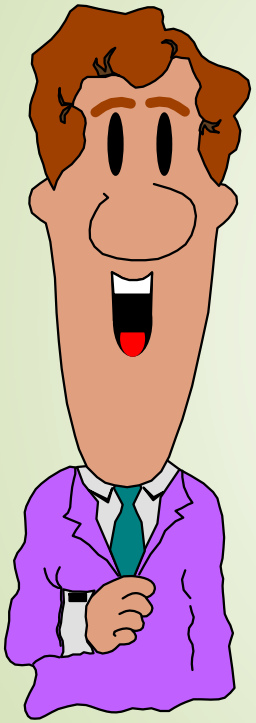
Key Ideas



1. Stormwater is a system like water and wastewater
2. Stormwater should be run in a comprehensive business-like manner with a business plan like…
3. To be effective you need SAFE revenue like…

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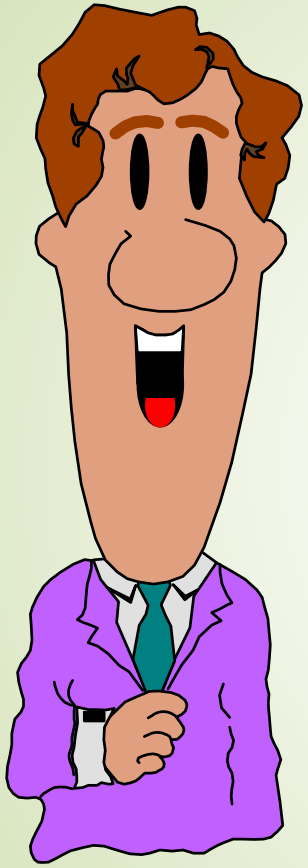

OK close the deal – why a stormwater utility fee approach to revenue?

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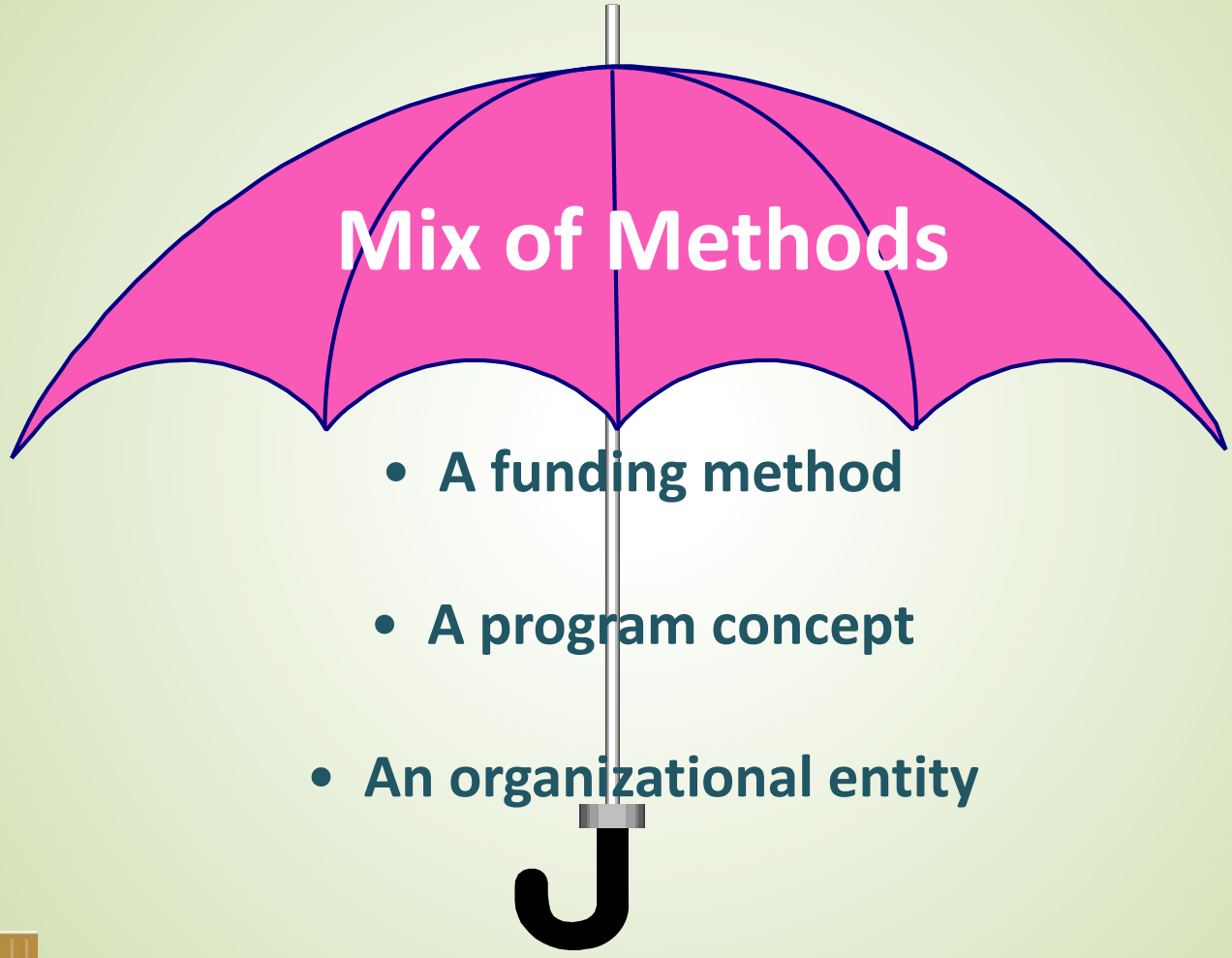
What Is a Stormwater Utility?

First of all…it is Revenue.



- A funding method
- A program concept
- An organizational entity

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Advantages of a Stormwater Utility to Support Programs

Read my lips:
"no new taxes"

- **S**table
- **A**dequate
- **F**lexible
- **E**quitable

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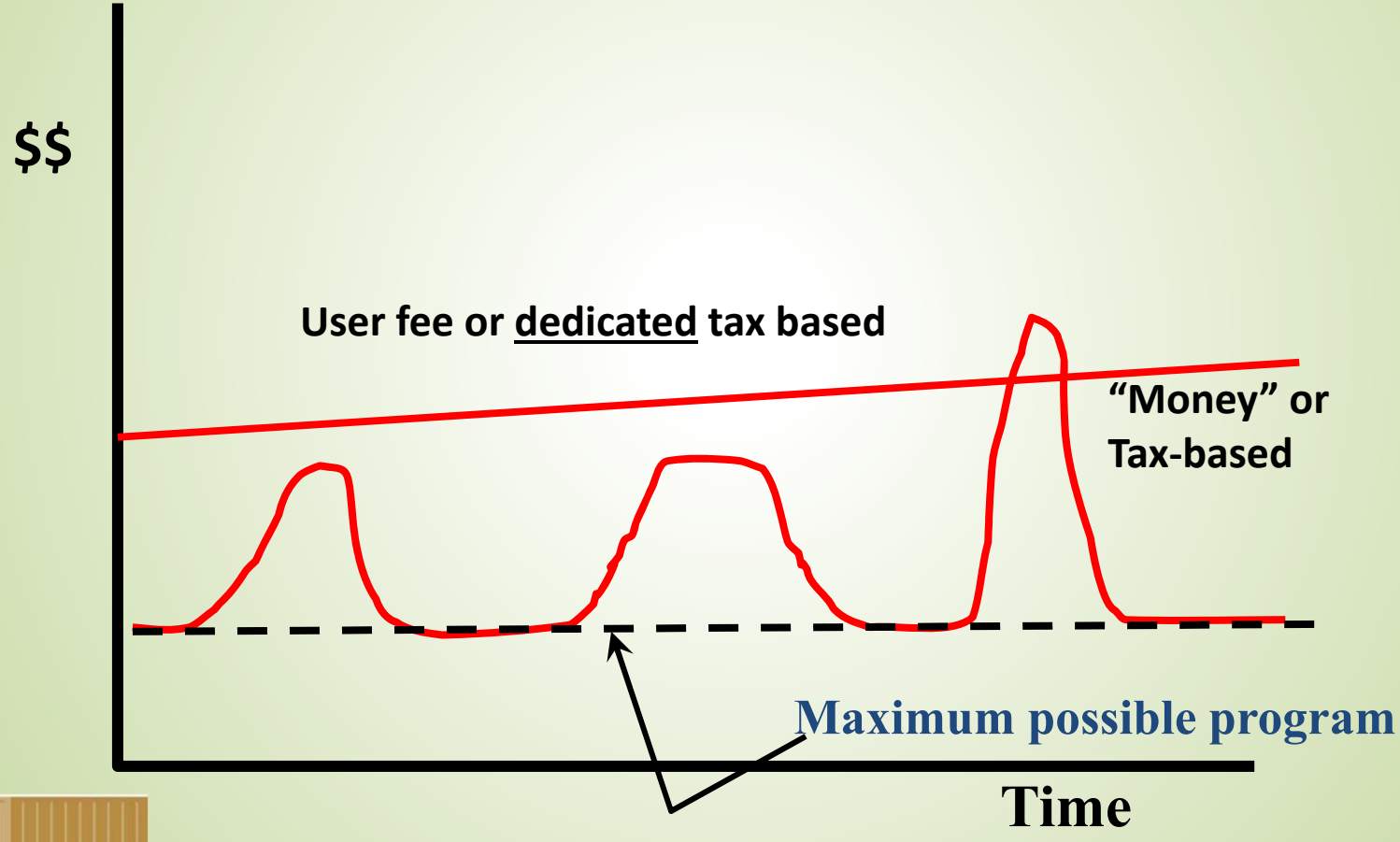
Stable

Revenue vs. “Money” Funding



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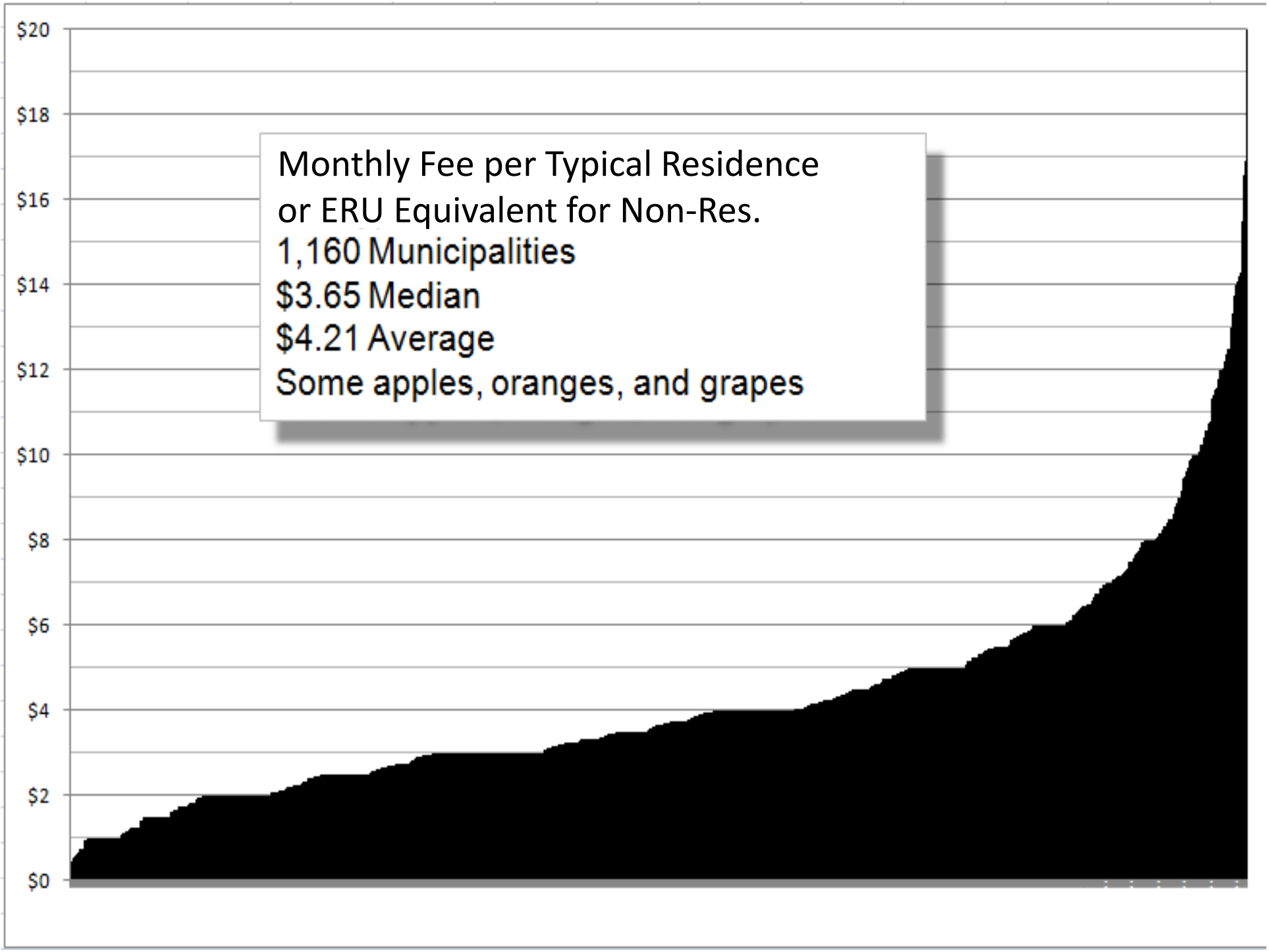
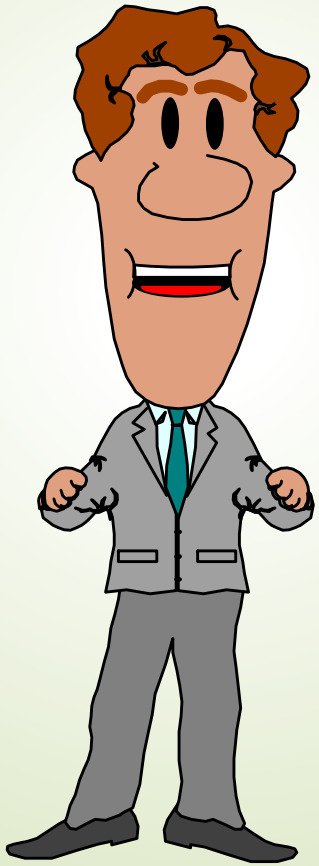

$20
$18
$16
$14
$12
$10
$8
$6
$4
$2
$0
Monthly Fee per Typical Residence
or ERU Equivalent for Non-Res.
1,160 Municipalities
$3.65 Median
$4.21 Average
Some apples, oranges, and grapes

Adequate

Okay - tell me when you start to feel this would be too much to charge per month for a residential property to solve scarcity, flooding, infrastructure and pollution problems where you live



$ 2

$ 4

$ 6

$ 8

$ 10

$ 12

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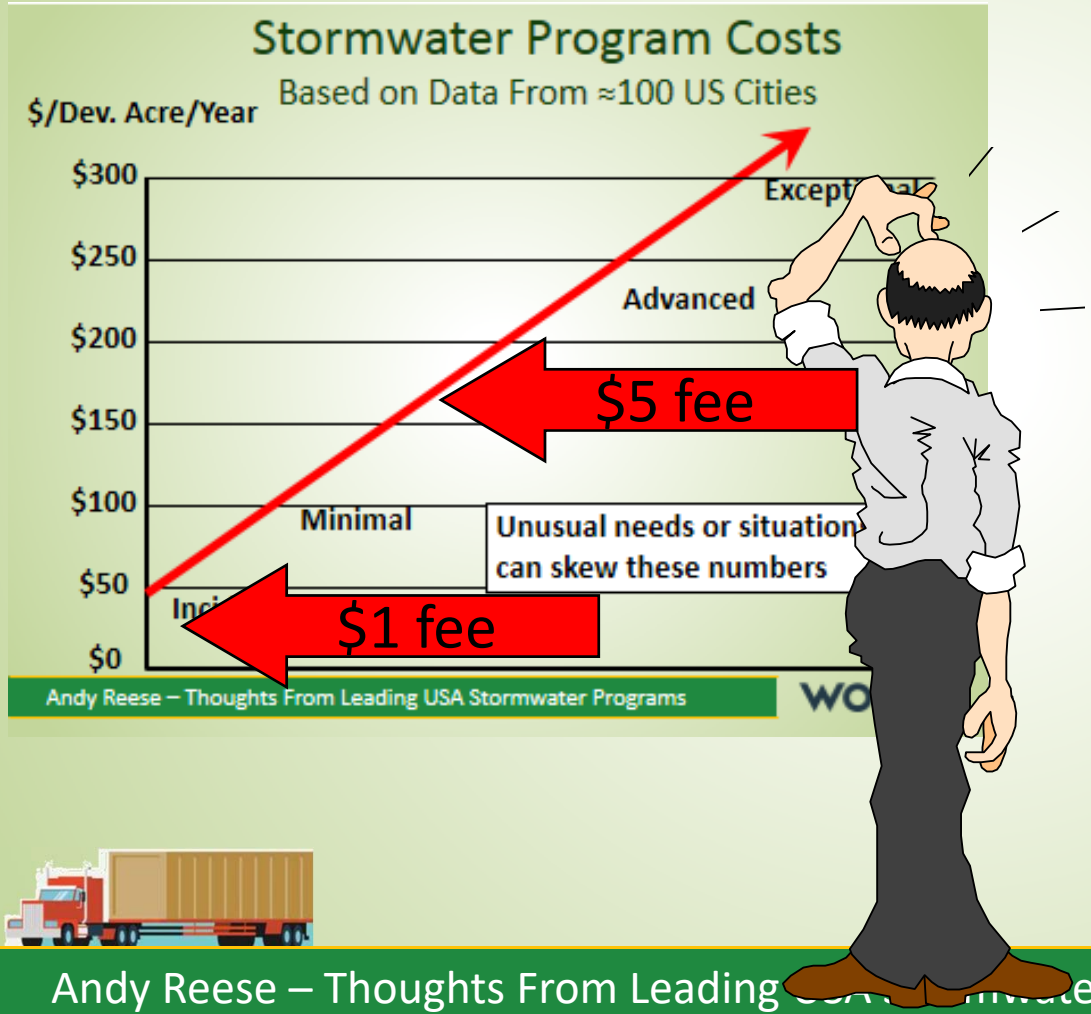
Adequate



For every $1 dollar per month per residence (and proportional fees to non-residences)

A utility can typically generate about $25 to $40 per developed acre per year.

Rough Revenue Estimates

Urban Area	Estimated 2018 Population	Area SQ K	$1.00	$3.00	$5.00	$8.00
Sydney	4,749,182	12,368	$ 60,322,000	$ 180,966,000	$ 301,610,000	$ 482,576,000
Melbourne	4,617,337	2,664	$ 59,204,500	$ 177,613,500	$ 296,022,500	$ 473,636,000
Brisbane	2,334,066	15,842	$ 28,734,000	$ 86,202,000	$ 143,670,000	$ 229,872,000
Perth	2,119,935	6,418	$ 25,668,000	$ 77,004,000	$ 128,340,000	$ 205,344,000
Adelaide	1,328,115	3,258	$ 16,805,000	$ 50,415,000	$ 84,025,000	$ 134,440,000
Gold Coast/Twead	660,163	414	$ 8,215,000	$ 24,645,000	$ 41,075,000	$ 65,720,000
Canberra/Queanbeyan	441,483	814	$ 4,974,000	$ 14,922,000	$ 24,870,000	$ 39,792,000
Hobart	212,895	1,695	$ 2,760,500	$ 8,281,500	$ 13,802,500	$ 22,084,000
Albany	35,580	297	$ 462,000	$ 1,386,000	$ 2,310,000	$ 3,696,000

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Flexible: No two are the same – fits any local or financial structure

1. Some organization(s) need to do stormwater
2. I need to be able to send a bill to all beneficiaries of the service
3. The rate structure needs to fit the needs and limitations

- Local Govt alone
- Water organization with Local Govt partners
- Urban area special stormwater district
- Local Govt or Water organization with private partner

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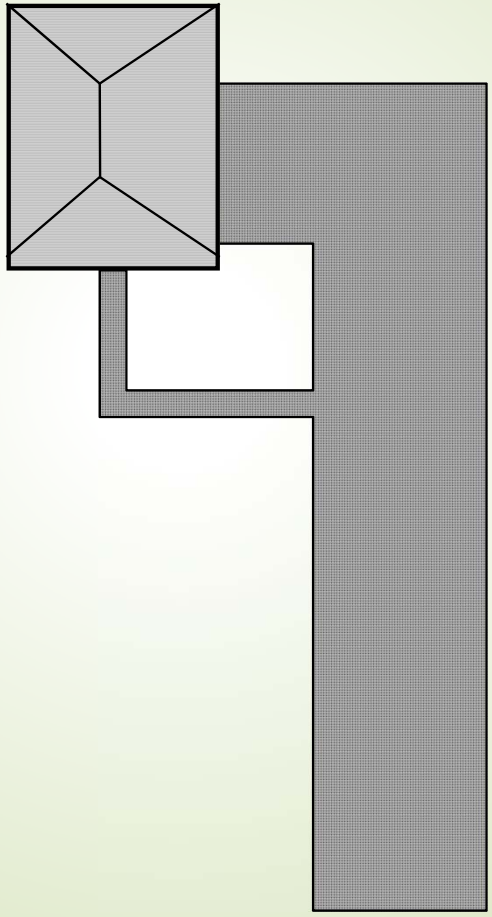
Equitable: How a Fee is Typically Calculated

"The more you pave the more you pay"

"use" of the stormwater system (think water or wastewater) is defined by: the amount of runoff or pollution put into the system, or protections of downstream properties



Equals 1.0 "ERU"

Say it is 200 sqm

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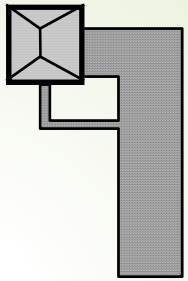
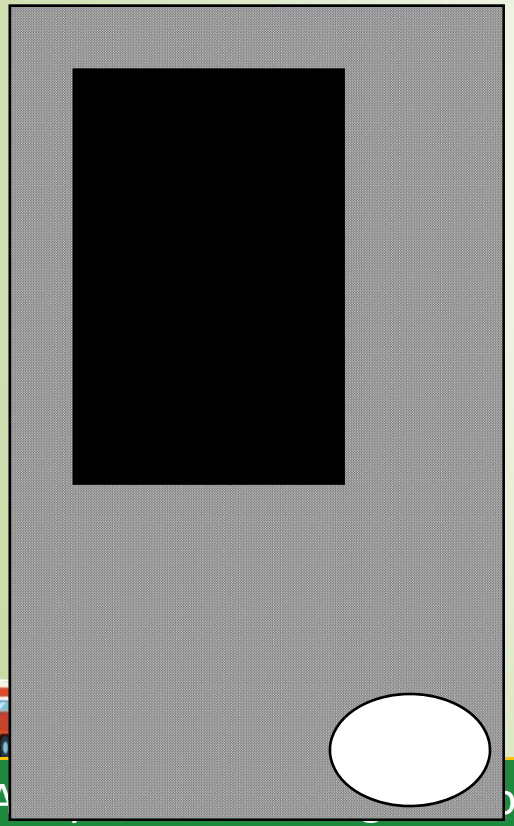
How a Fee is Calculated



= 1 ERU



= 40 ERUs less credit

Rate structures can reflect a number of different things…not just impervious area


Welcome to your new life
in stormwater

OK, lets pretend I'm interested. How do I get started?

Hint: We never ask if we can start a user fee; we only ask if we can continue the process of seeing if it is acceptable and feasible… till the last vote.

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D*V*P Logic Flow

1. **The problems are real, growing and unresolved**
2. **We can resolve them, we have a good plan**
3. **Government must lead, individual citizens cannot solve it**
4. **Benefits will result, it will be worth it**
5. **It will cost more than we are spending now**
6. **Among viable options a user fee is the best & most equitable to be the cornerstone of funding**
7. **If we ignore the problem… well… we'll be back soon.**

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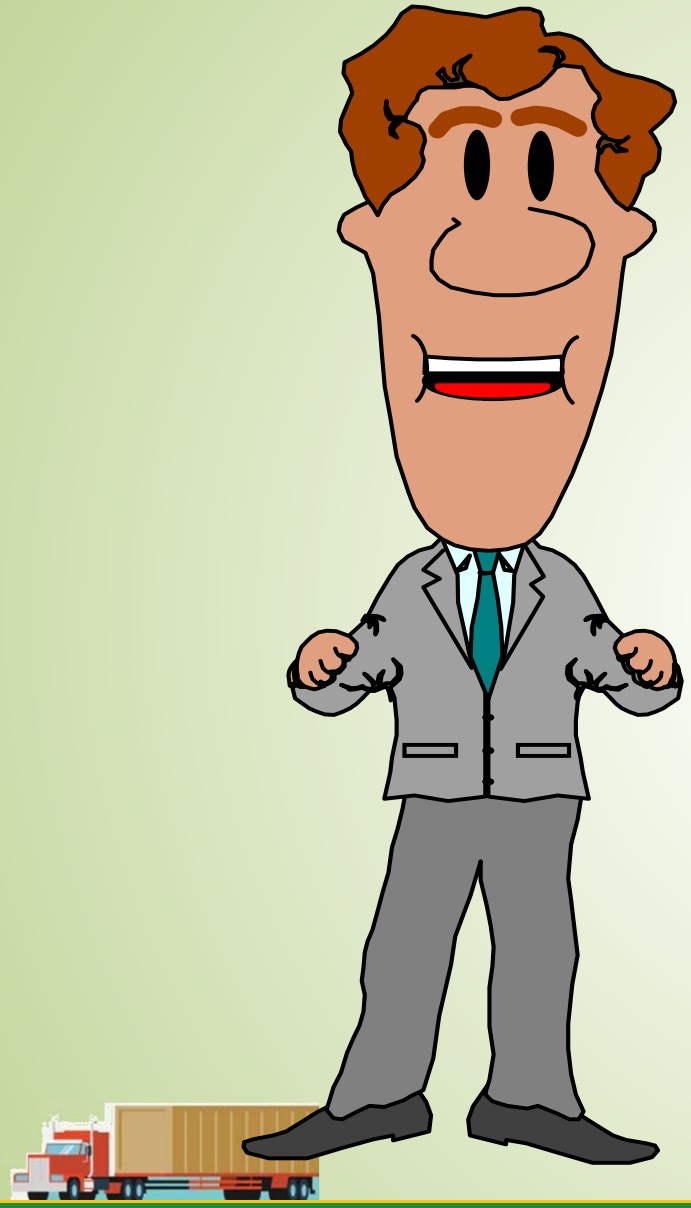


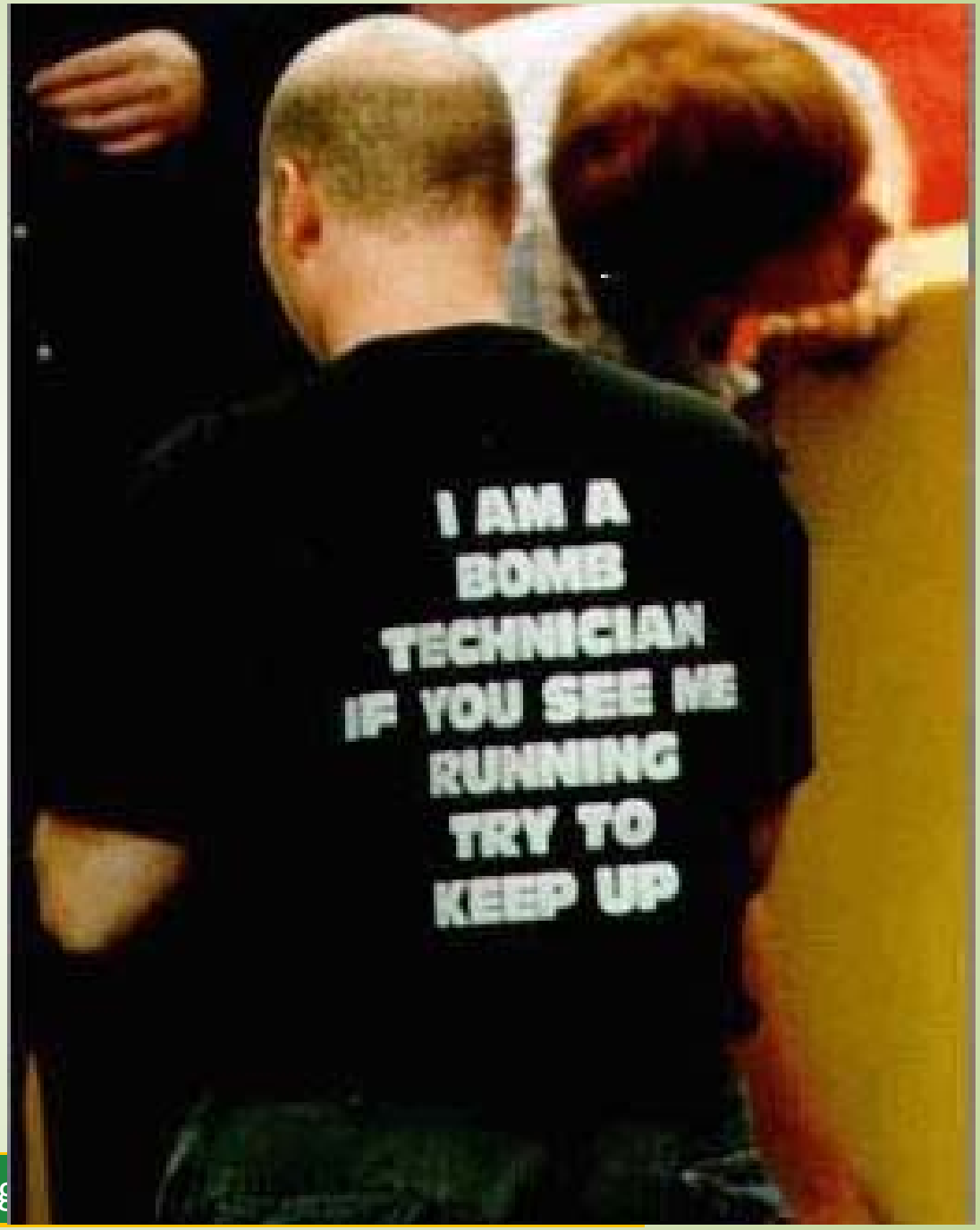
First you must know why you are doing this and it has to be both emotionally compelling and logical!

Not just to you!

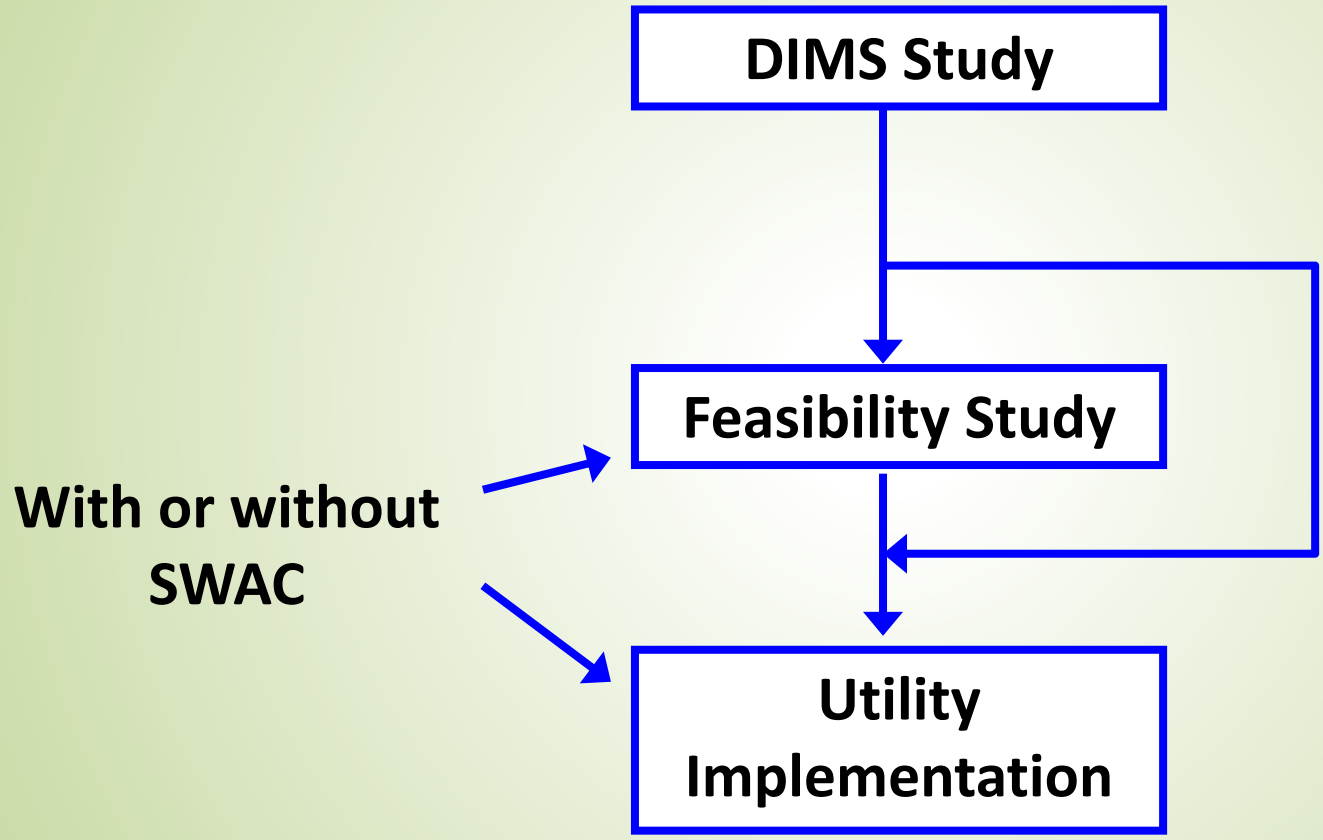
wood.

Are lots of drivers for action

… but are they <u>compelling</u> ?



2 or 3 Step Process



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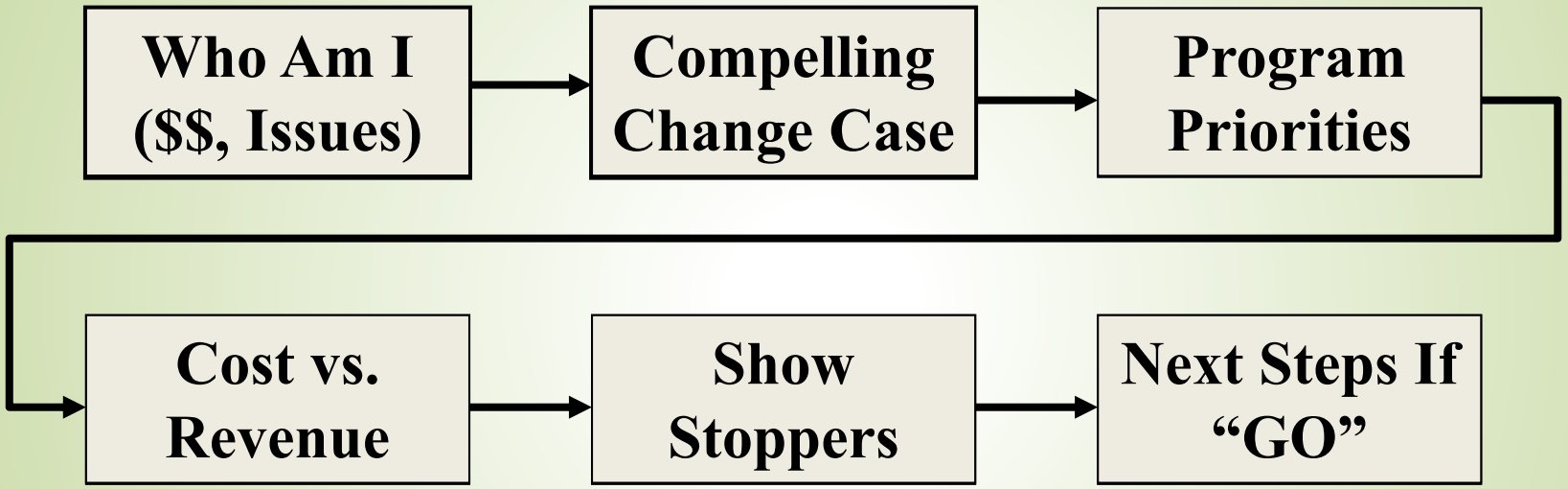
“Does It Make Sense”



We will be trying this out in Redlands later this month

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Feasibility Study

A feasibility study takes a group of staff and citizens on a walk through all the key aspects of utility development without committing to utility development until all concerned agree it is the right way to go.

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Utility Implementation

A Five-Track Process

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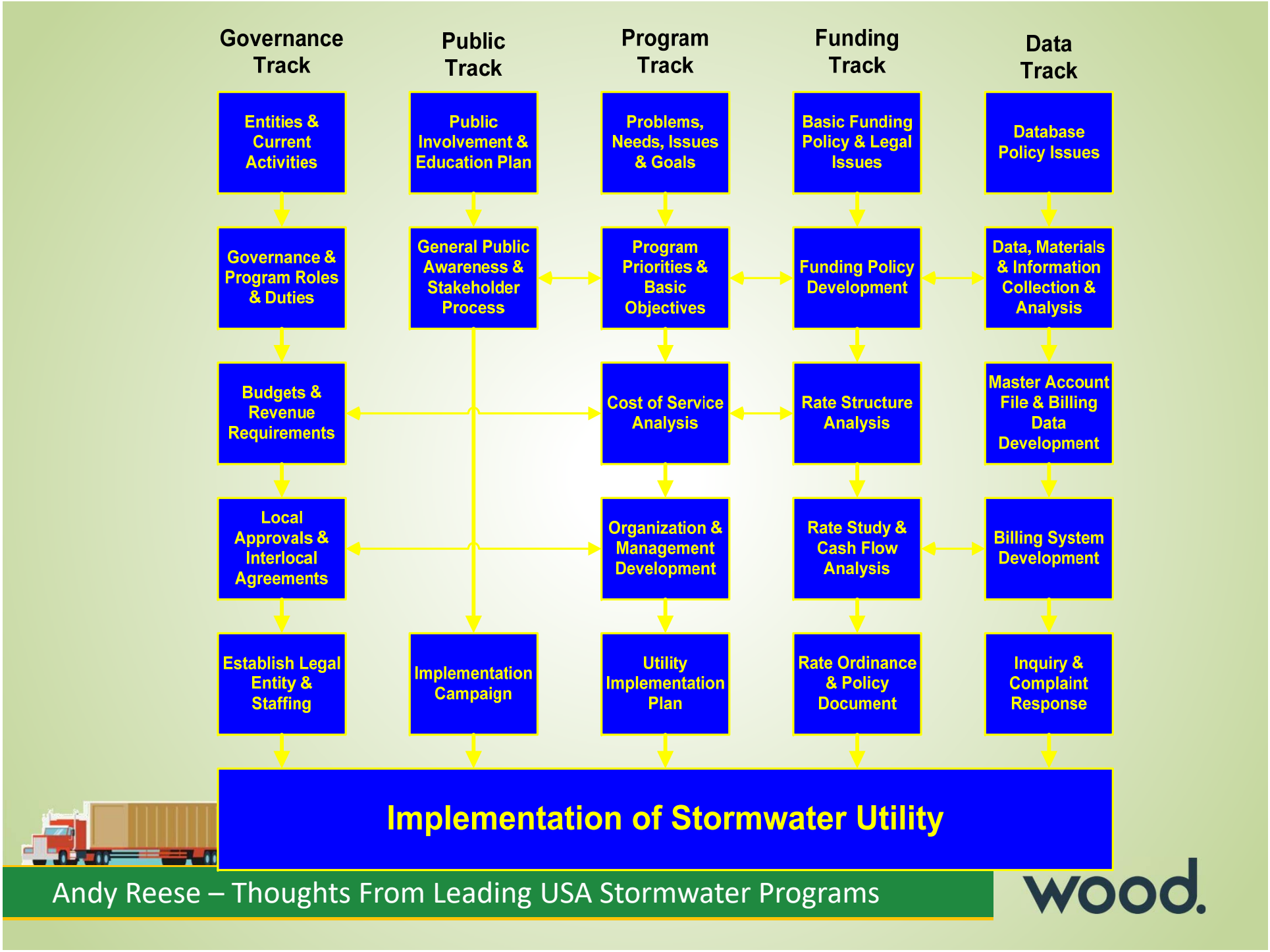
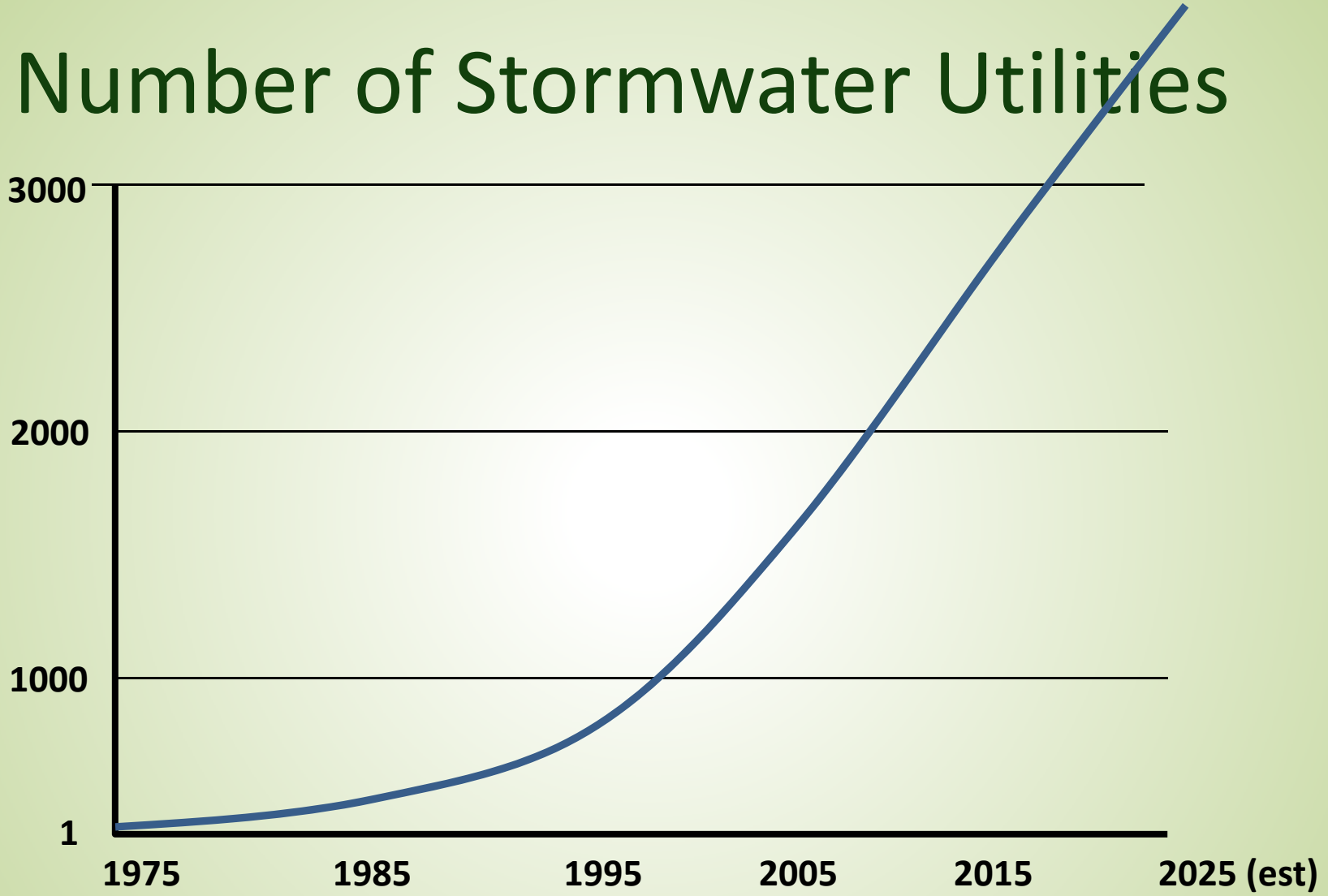

Governance Track
Public Track
Program Track
Funding Track
Data Track
Entities & Current Activities
Public Involvement & Education Plan
Problems, Needs, Issues & Goals
Basic Funding Policy & Legal Issues
Database Policy Issues
Governance & Program Roles & Duties
General Public Awareness & Stakeholder Process
Program Priorities & Basic Objectives
Funding Policy Development
Data, Materials & Information Collection & Analysis
Budgets & Revenue Requirements
Cost of Service Analysis
Rate Structure Analysis
Master Account File & Billing Data Development
Local Approvals & Interlocal Agreements
Organization & Management Development
Rate Study & Cash Flow Analysis
Billing System Development
Establish Legal Entity & Staffing
Implementation Campaign
Utility Implementation Plan
Rate Ordinance & Policy Document
Inquiry & Complaint Response
Implementation of Stormwater Utility

Number of Stormwater Utilities



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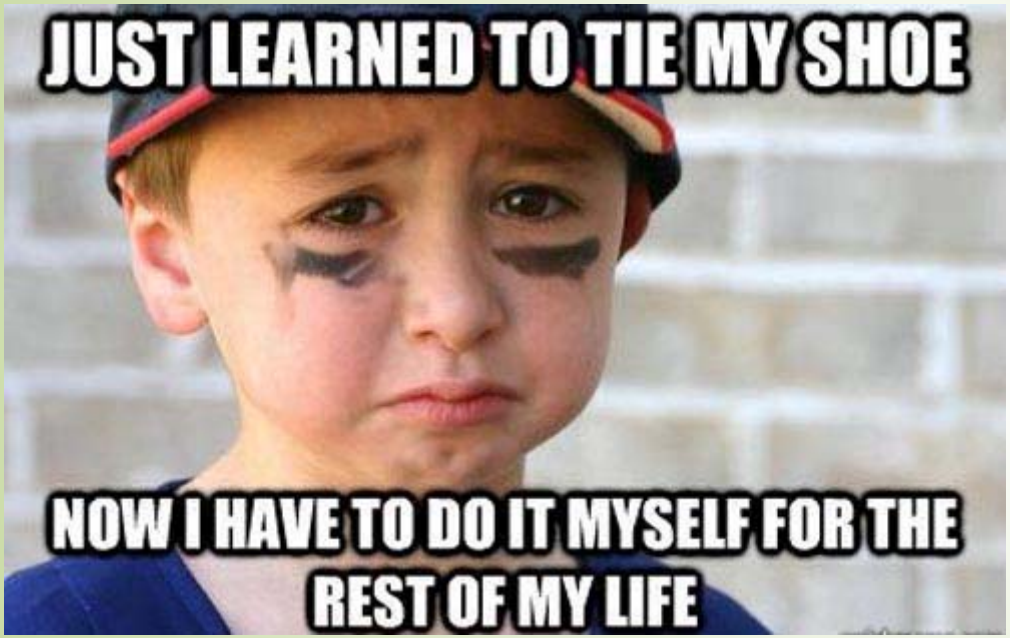
Stormwater, Its Time to Grow Up –



Get a job, get married, buy a house, and have kids just like… your older sibs water and wastewater.

I would be glad to brainstorm with you about these ideas and your community

Andy Reese

andrew.reese@amecfw.com

0431 734 502 Until November 19th

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wood.