No Adverse Impact

A Proposed National Standard

Association of State Floodplain Managers

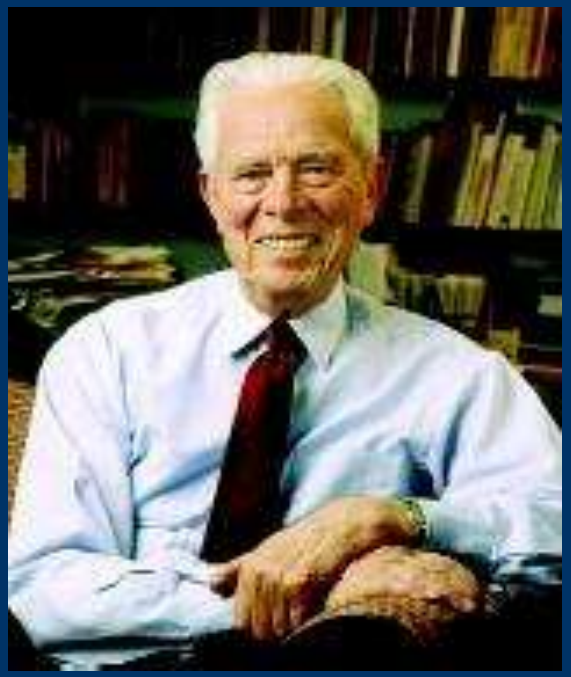
2017 Annual Conference
Kansas City, MO

May 3, 2017

Ronald D. Flanagan, CFM

Flanagan & Associates, LLC
Environmental Planning Consultants

DEDICATION



Dr. Gilbert White

Father of American Floodplain Management

Dr. Jon Kusler

Floodplain Law & Beneficial Use

Ian Mc Harg

Pioneer, Urban Environmental Planning

- Natural Floodplains
- Urbanization/Development
- Stormwater Law
- No Adverse Impact
- Challenges
  - Overland Flow

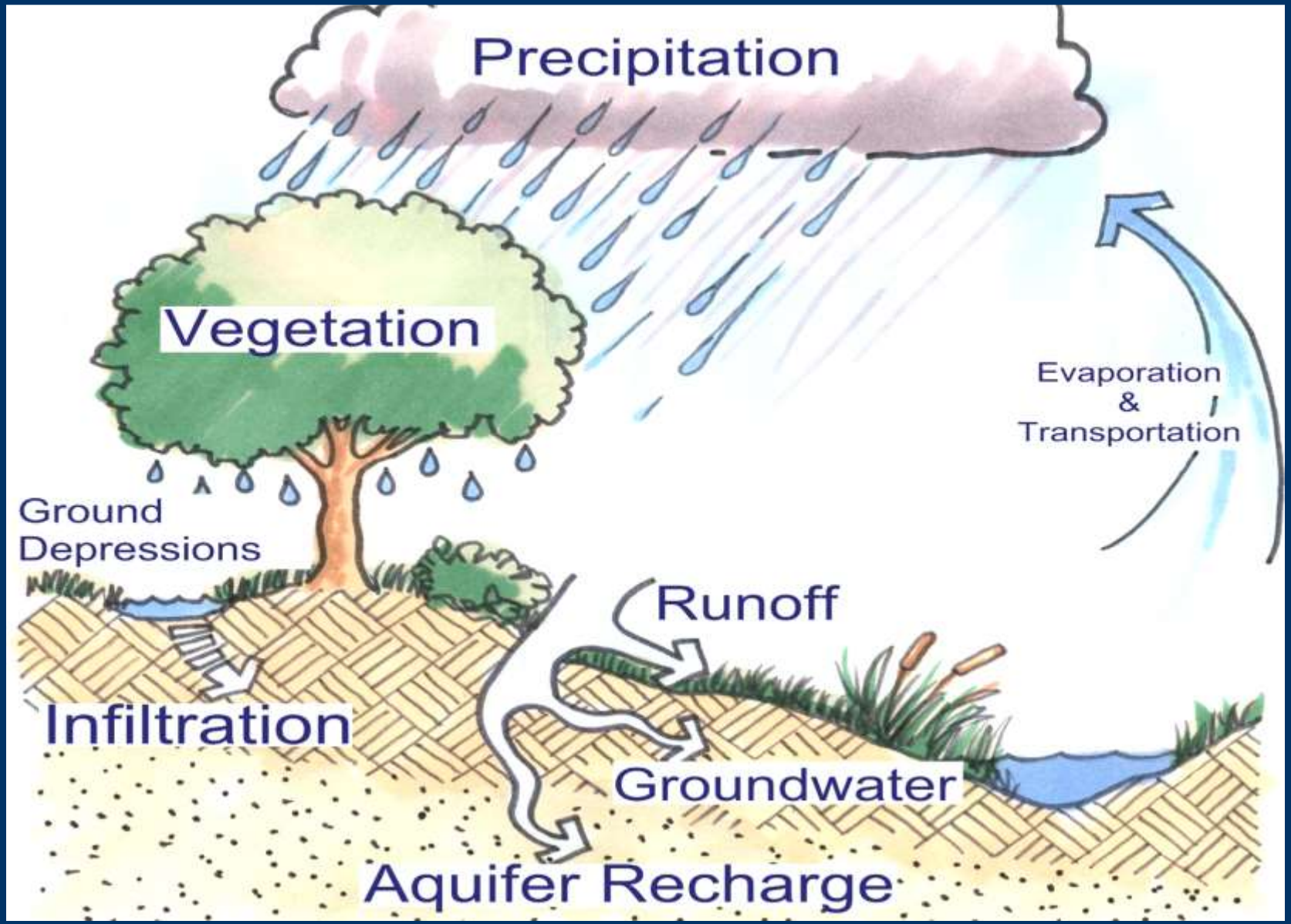
Floodplain Management's Mission

Mitigate the losses, costs, and human suffering caused by flooding.

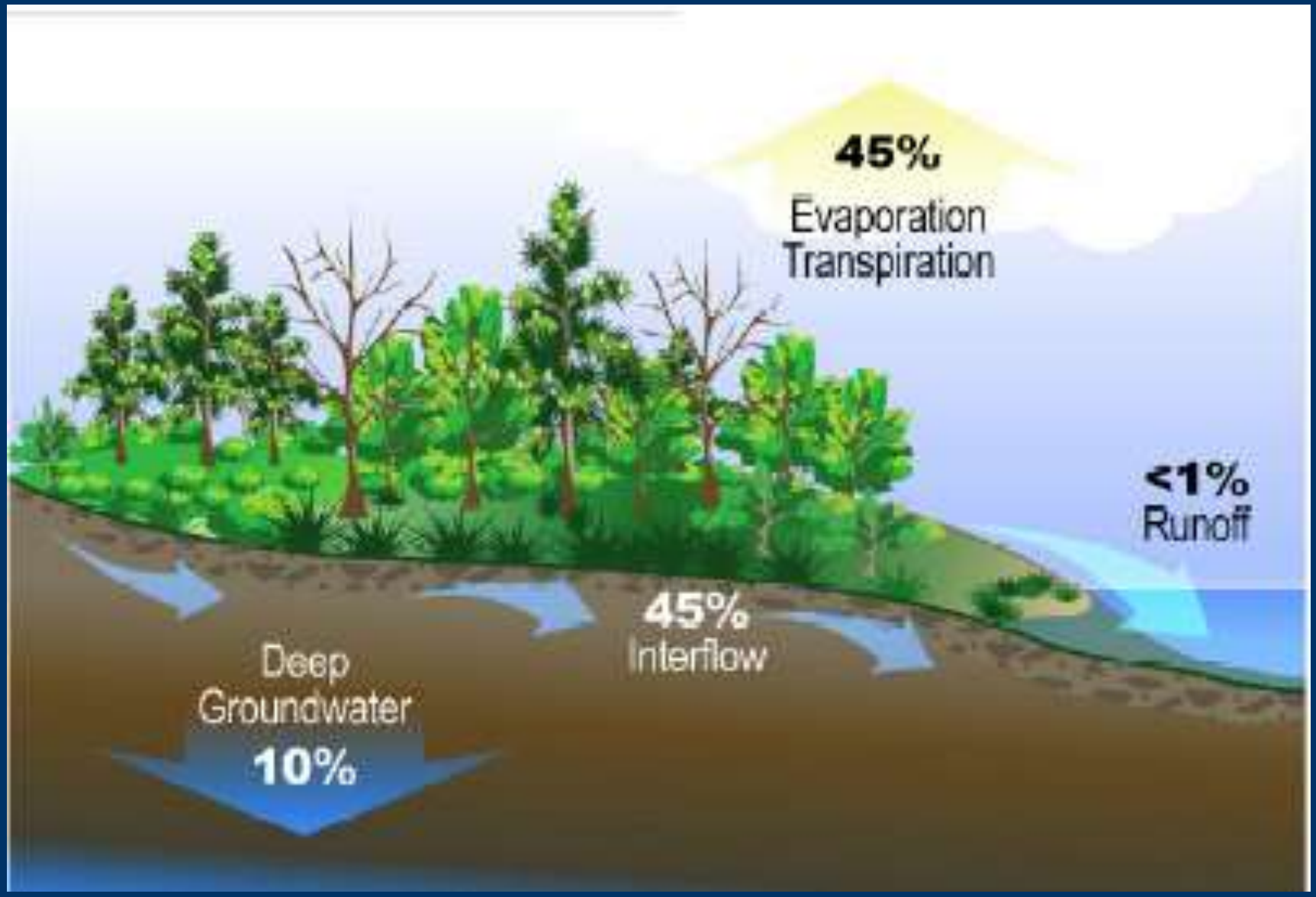
and

Protect the natural and beneficial functions of floodplains.

Natural Floodplains



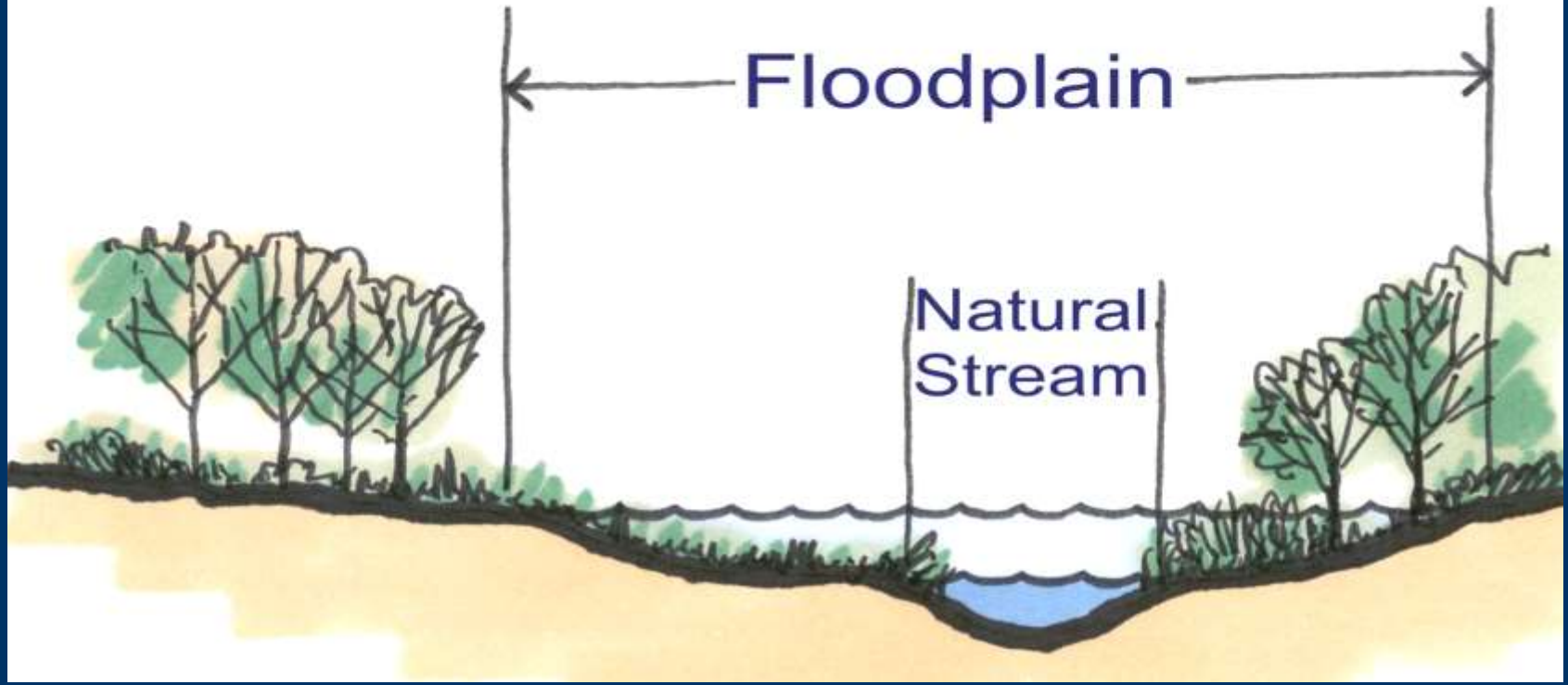
The Hydrologic Cycle



Rainwater Runoff Under Natural Conditions

Functions

- Conveyance
- Storage

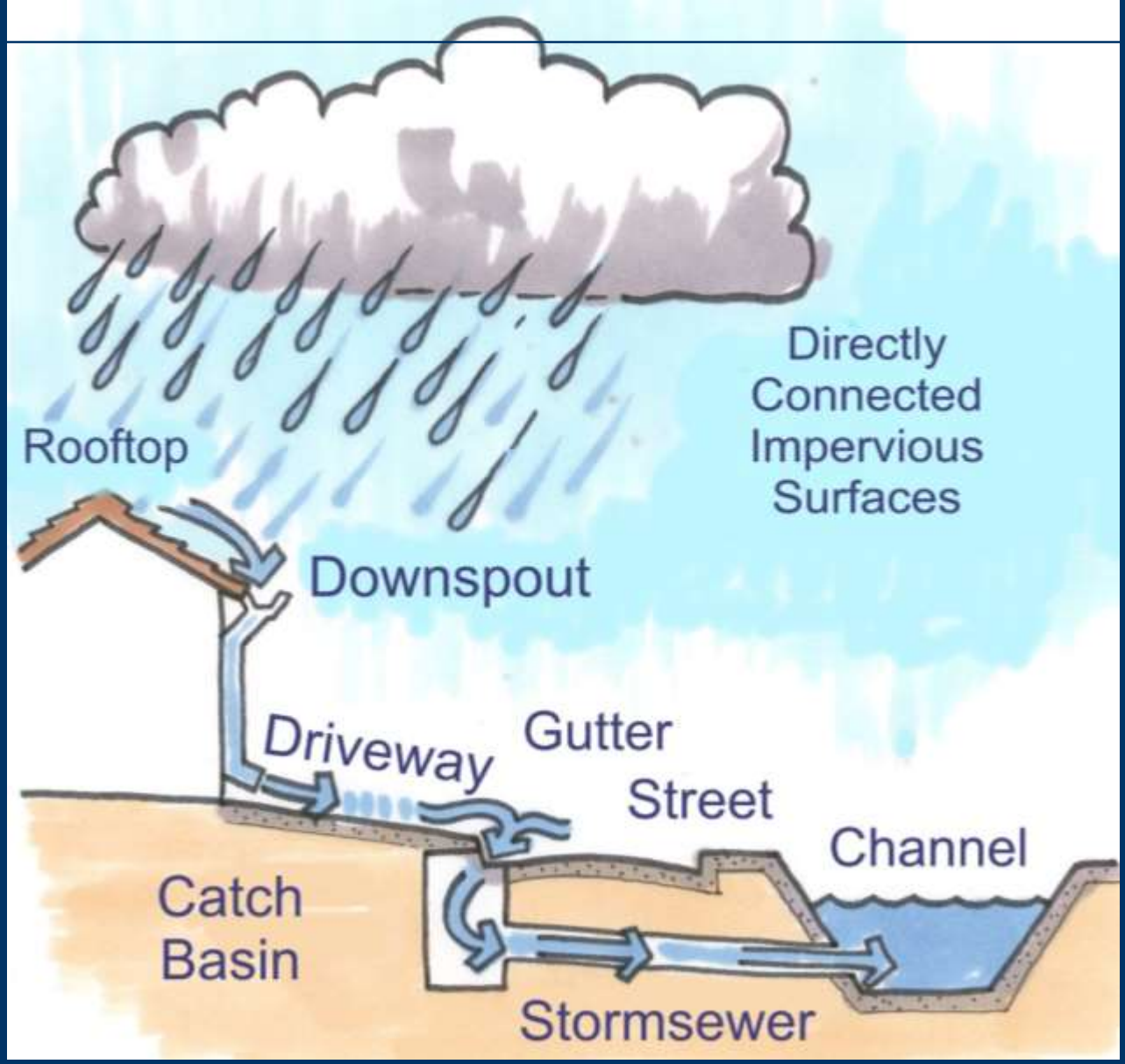


Natural Floodplain

Urbanization / Development

The Promise of Urban Development

Stormwater Runoff under Urbanized Conditions



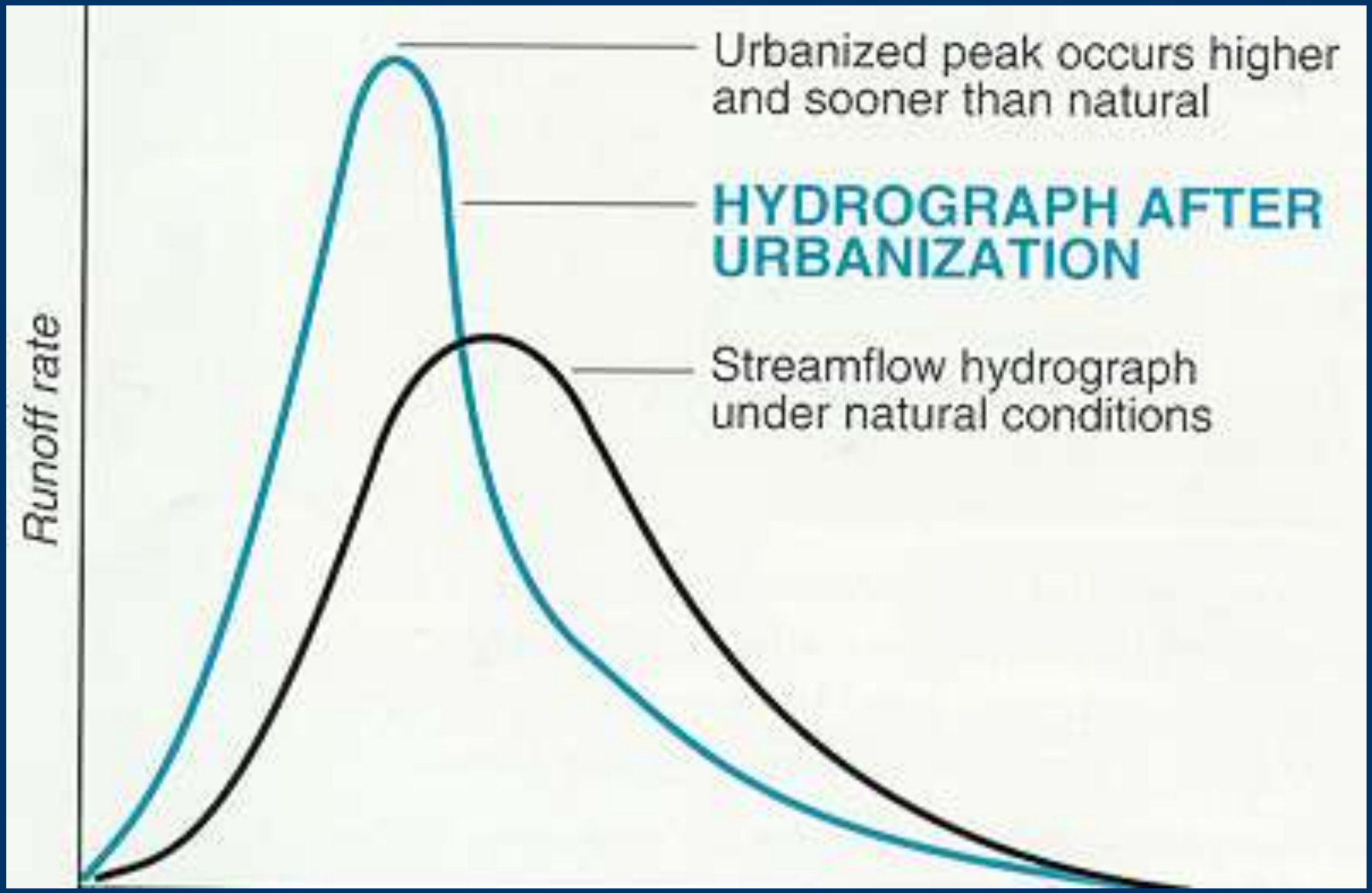
The Urban Hydrologic Cycle

Percent of Runoff

	Natural	**Urban**
Absorption	**65%**	**35%**
Runoff	**35%**	**65%**

Urbanization results in a

94% Increase in Runoff



Urban Hydrograph

Stormwater Law

Masters of Urban Stormwater Law

Ed Thomas

Natural Hazards Mitigation Association

Dr. Jon Kusler

Association of State Wetland Managers

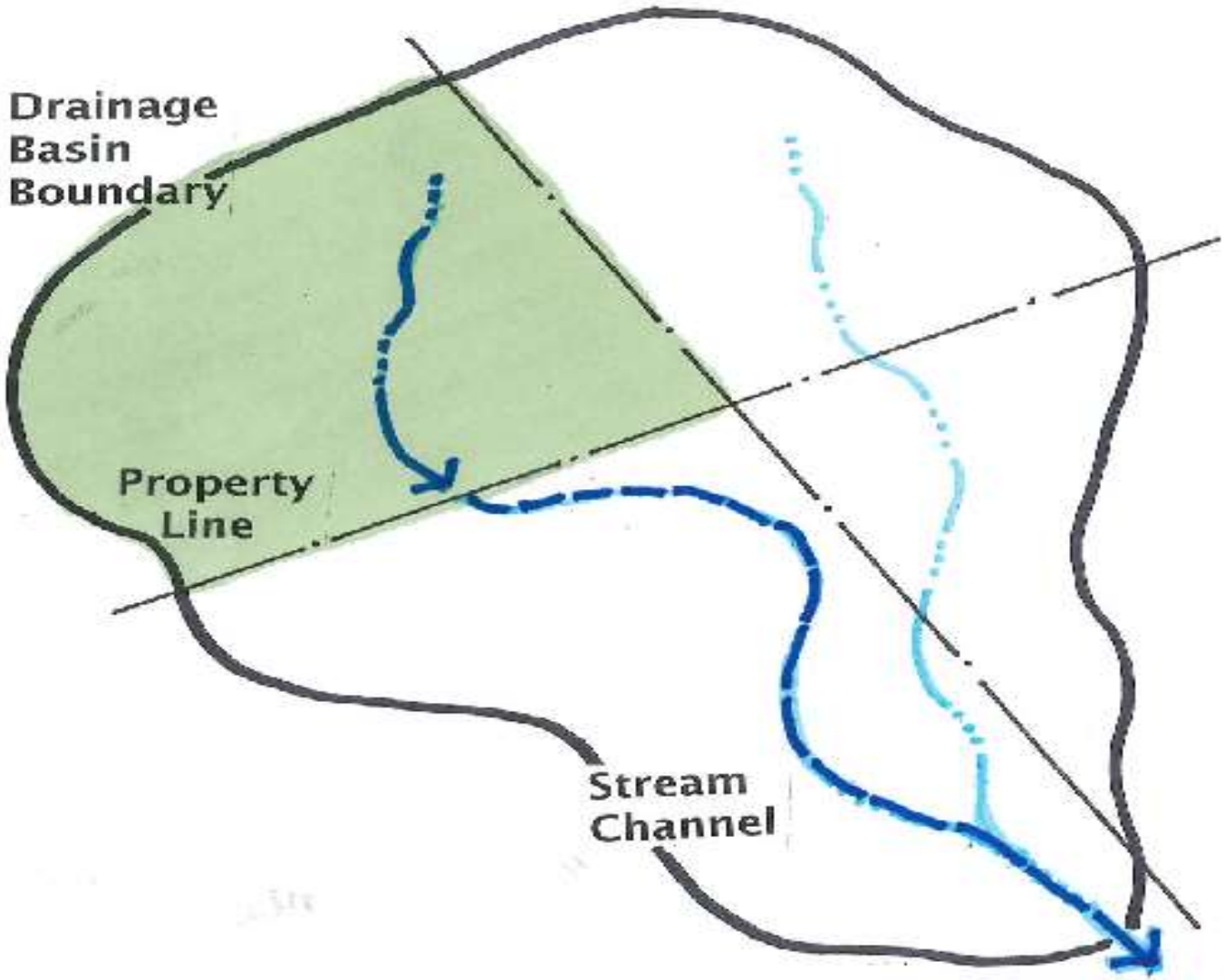
Rep. Ruth Wright

Attorney, Colorado Legislature

Common Law

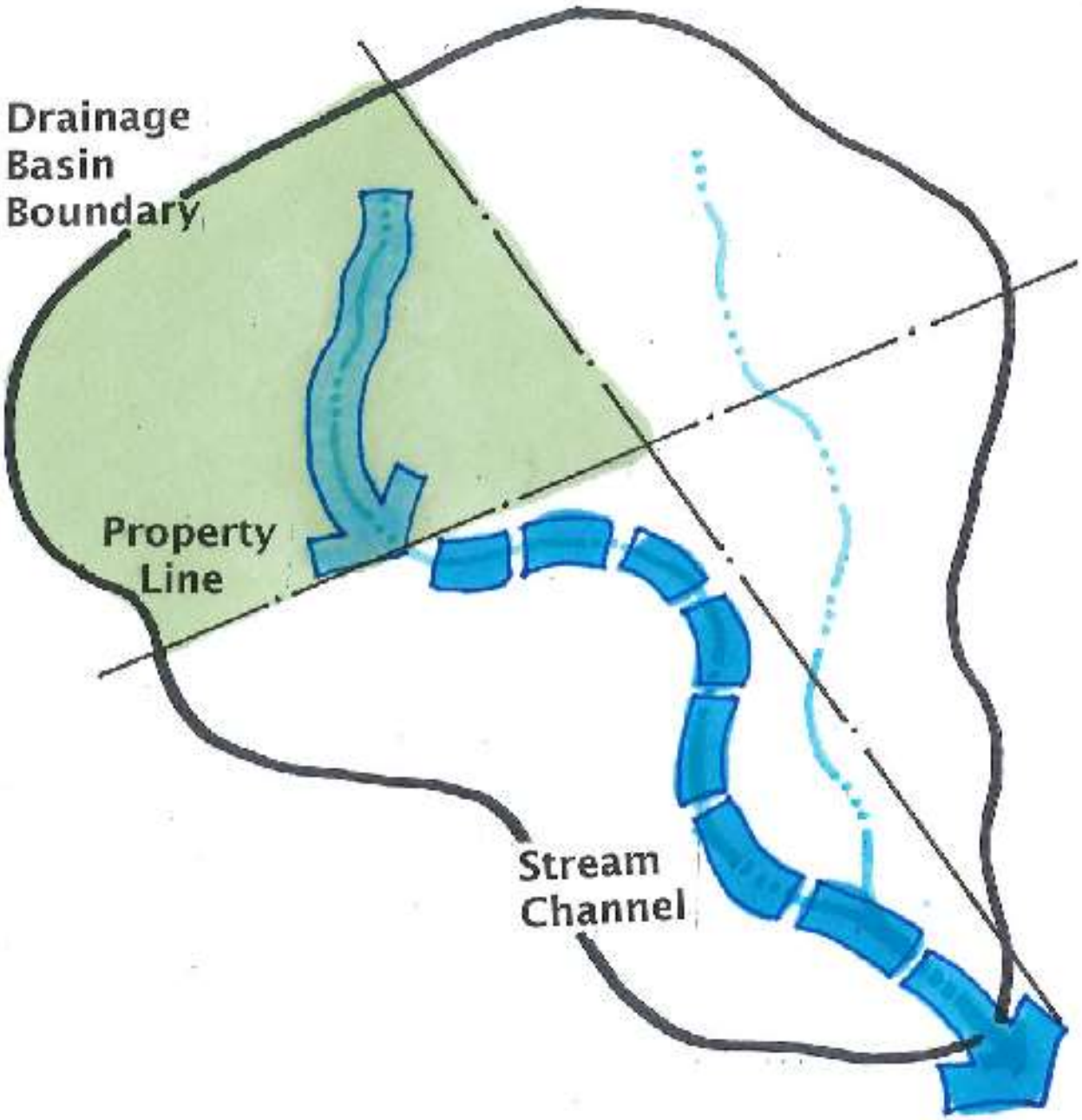
- **"COMMON ENEMY" RULE:**

"Flood-waters are a common enemy. A landowner has the right to repel a common enemy."



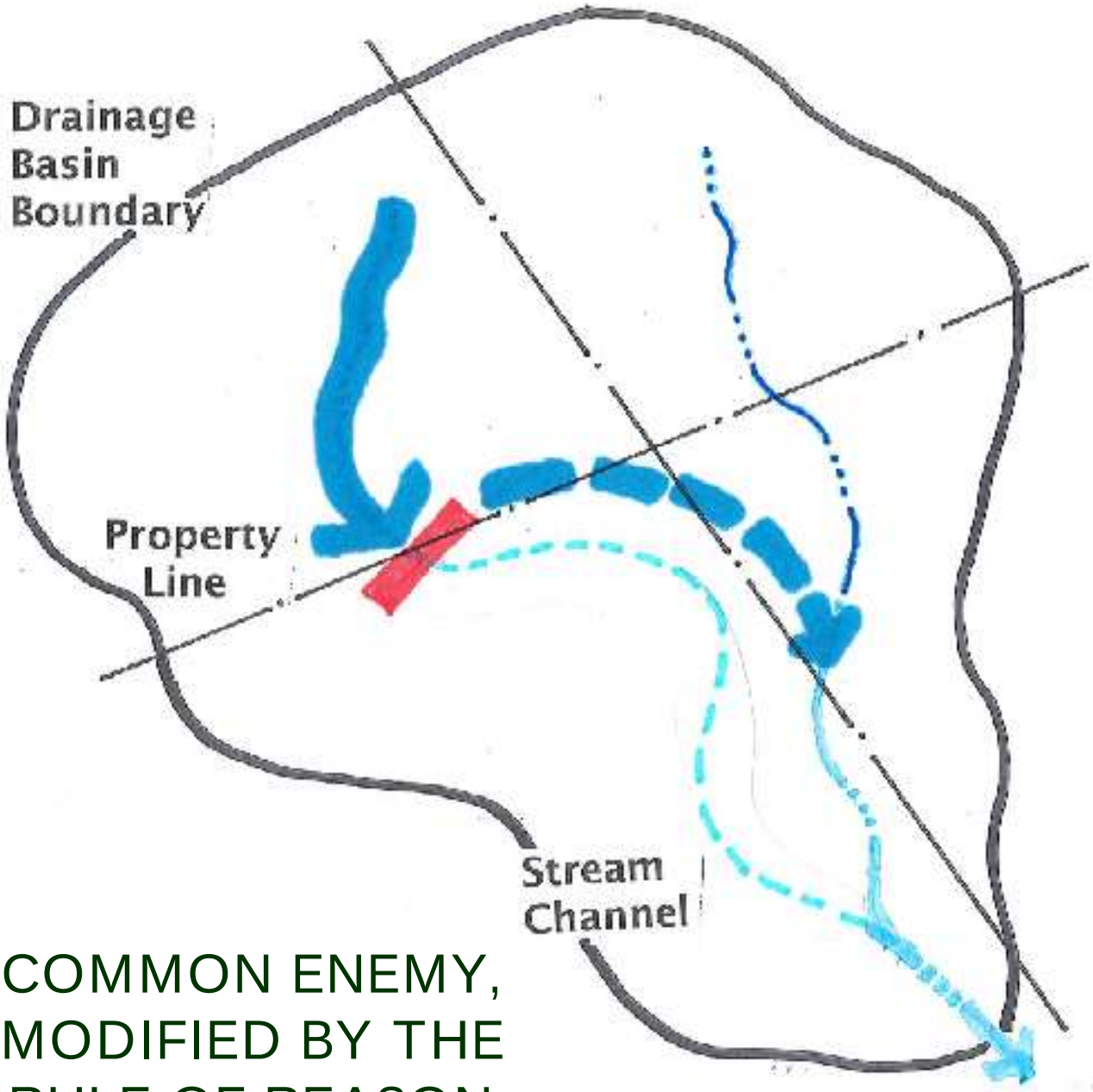
Stormwater Law

"The upper land owner has a drainage easement over the lower property, which must take natural drainage."



Stormwater Law

"Liability may result if waters are sent down in greater quantity or speed than under natural conditions."



COMMON ENEMY, MODIFIED BY THE RULE OF REASON

Stormwater Law

"A property owner has the right to protect himself, but not at the expense of others."

"He cannot make the common enemy less dangerous to himself and more dangerous to others."

Stormwater Law

- **EQUAL PROTECTION OF THE LAW CLAUSE:**
- "All similarly situated properties must be treated alike."

No Adverse Impact

No Adverse Impact

Larry Larson

Doug Plasencia

No Adverse Impact is the primary/basic characteristic of all Law, Government & Personal Relationships:

You cannot do anything that would have an Adverse Impact on Others

"Do Unto Others as You would have Others do Unto You"

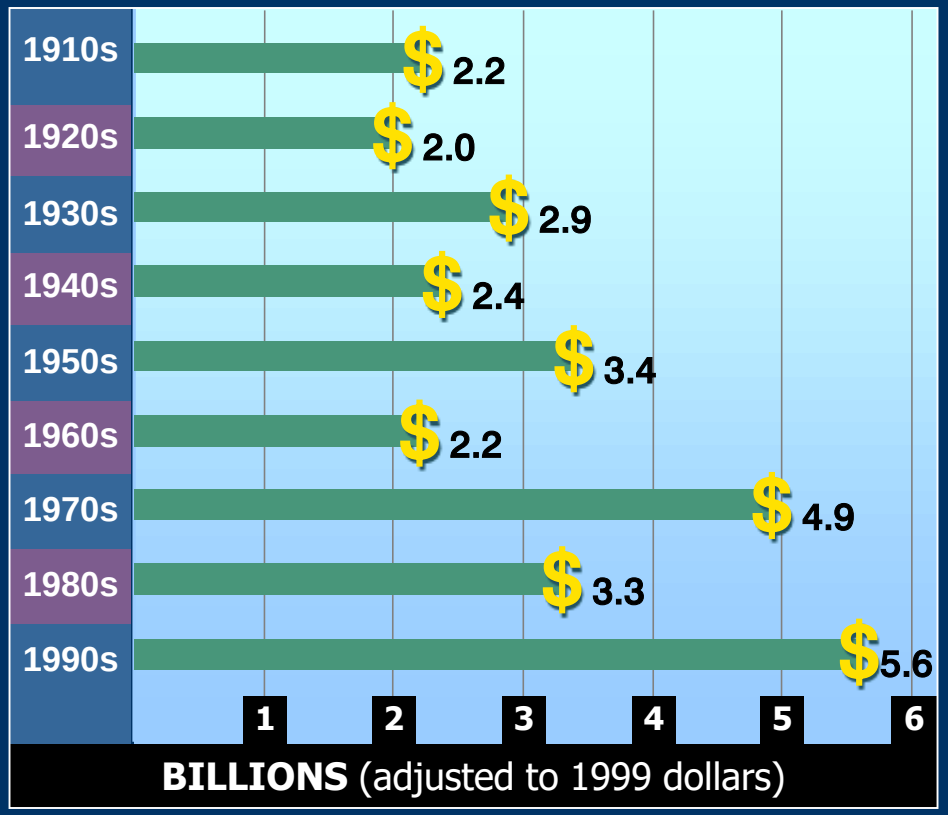
No Adverse Impact Floodplain Management takes place when the actions of one property owner are not allowed to adversely affect the rights and safety of other property owners

Current National Floodplain Policy

Local Governments assume that the minimum NFIP standards provide acceptable flood protection

Trends in Flood Damages

- $6 billion annually
- Four-fold increase from early 1900s
- Per Capita Damages increased by more than a factor of 2.5 in the previous century in real dollar terms



Why No Adverse Impact?

Flood damages are rapidly increasing *unnecessarily!*

Current approaches deal primarily with *how to build in a floodplain vs. how to minimize future damages*

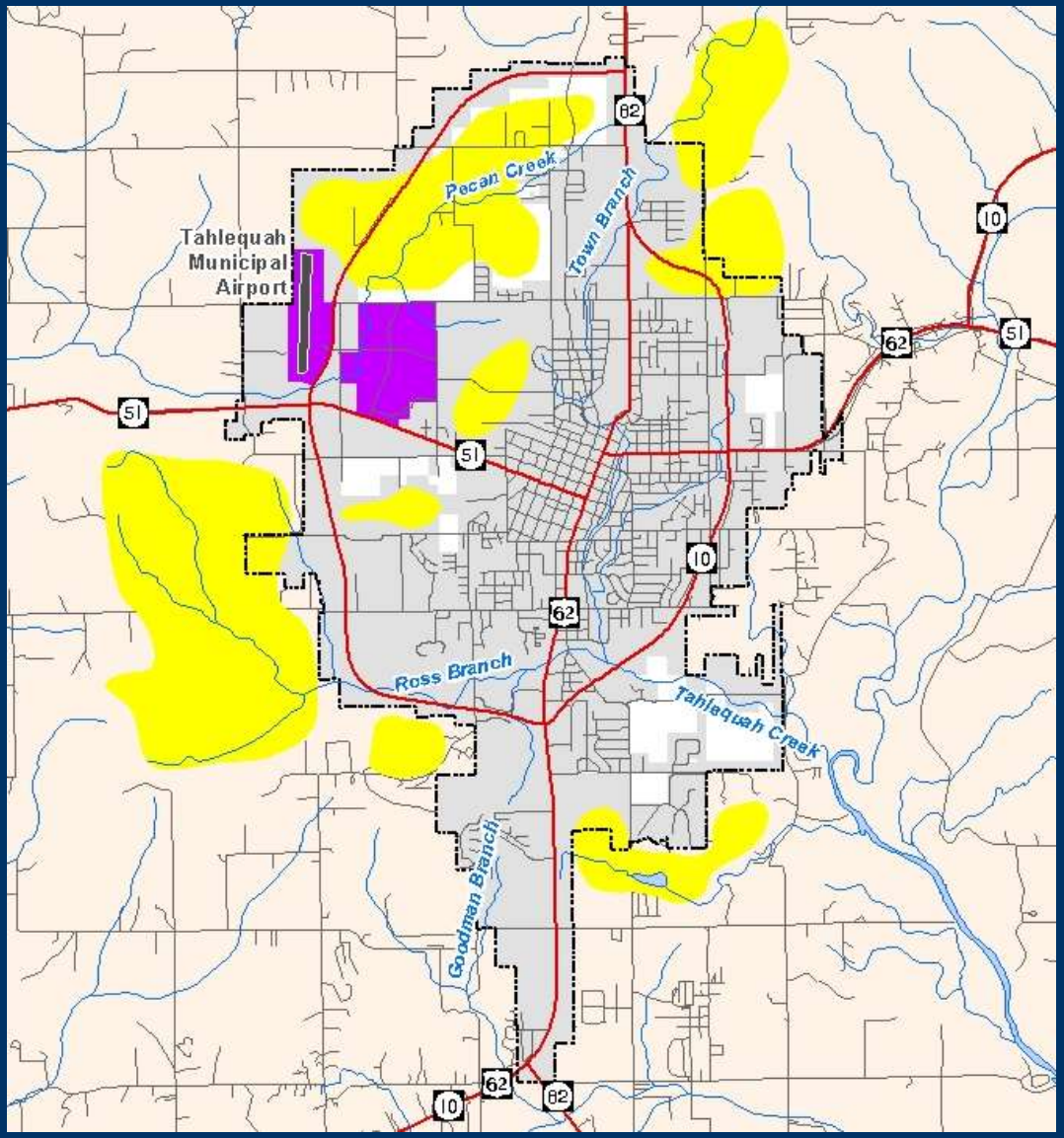
What is Influencing the Trend?

Increased Property at Risk

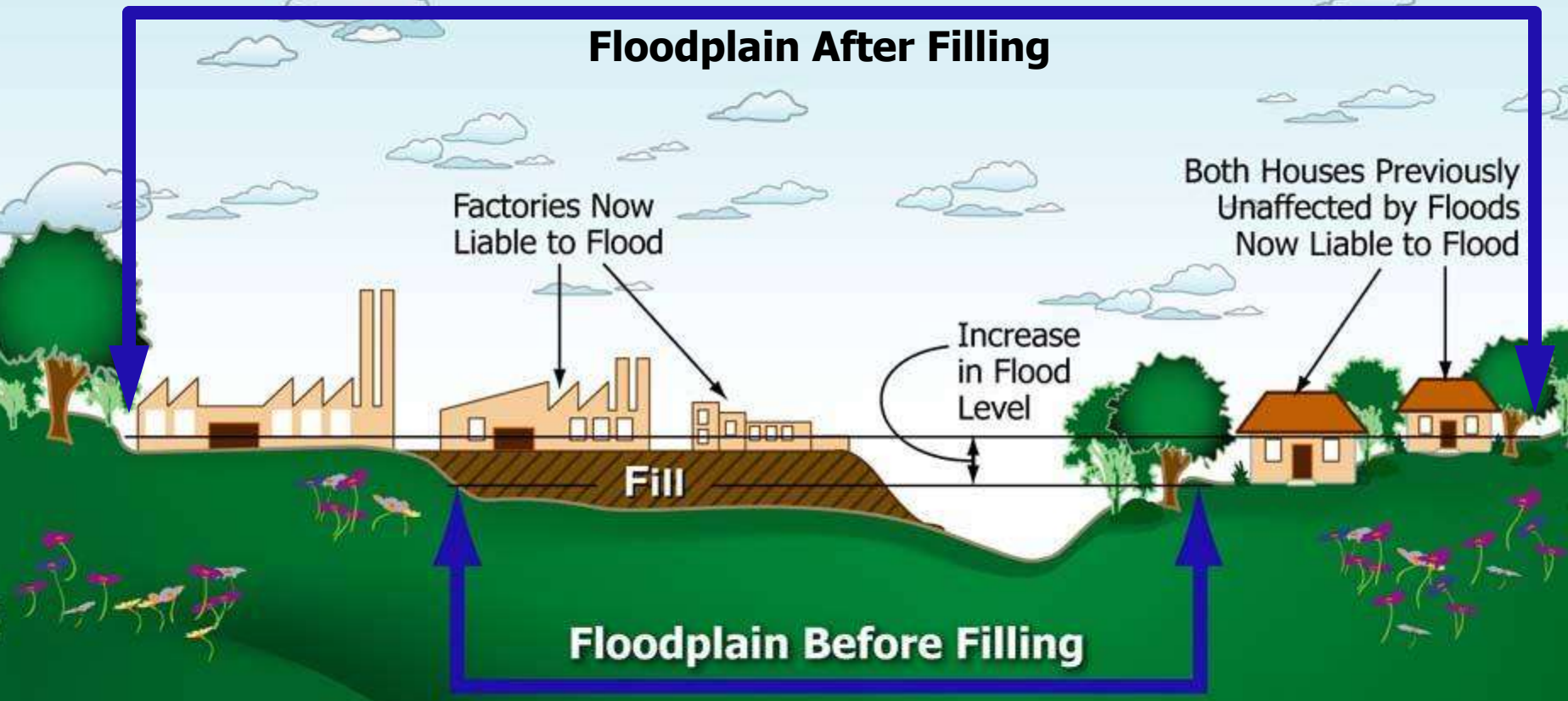
Current National (NFIP) Policy:

- Promotes intensification in risk areas
- Ignores changing conditions
- Ignores adverse impacts to existing properties
- Undervalues natural floodplain functions

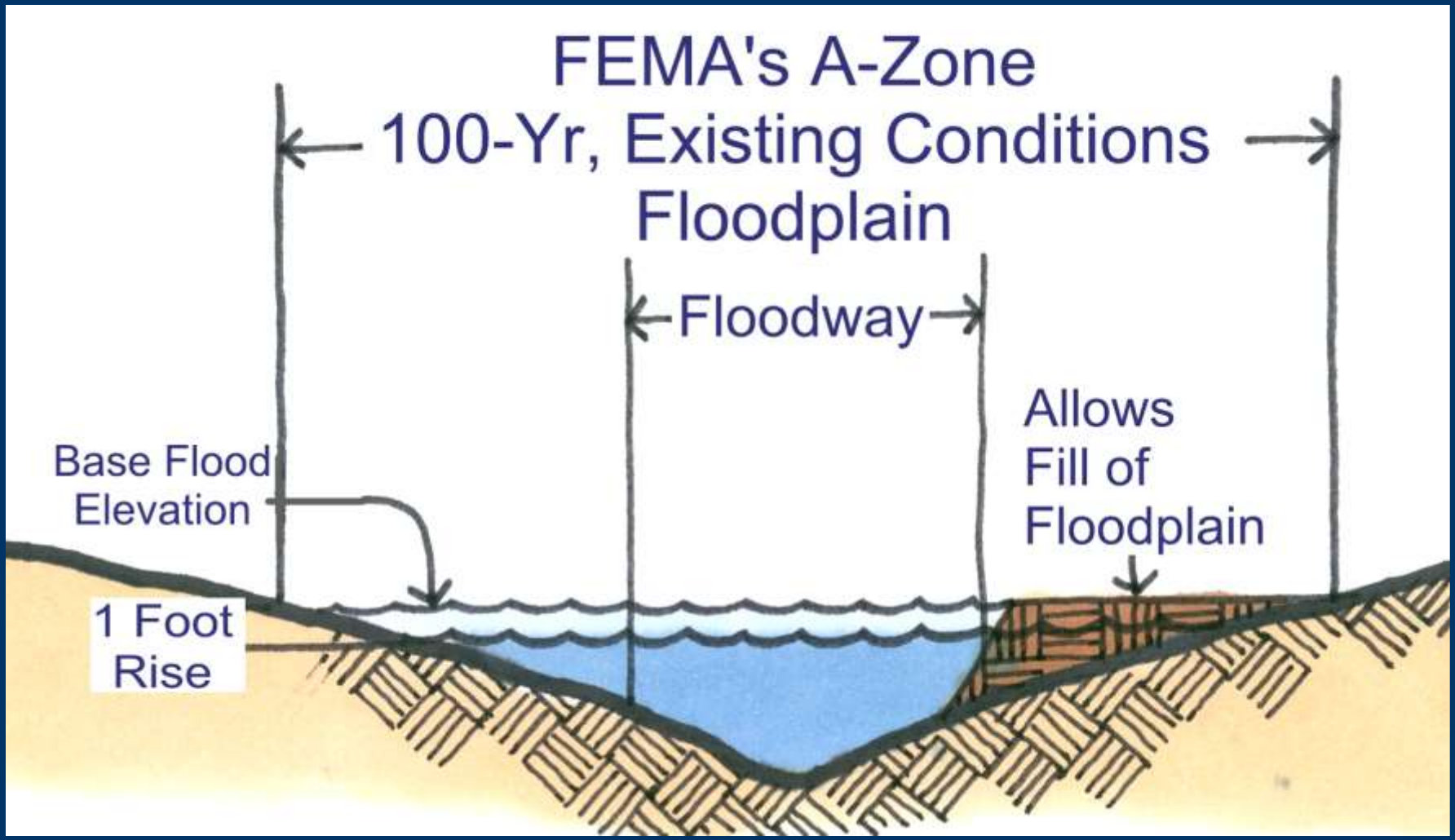
Future Growth Areas Map



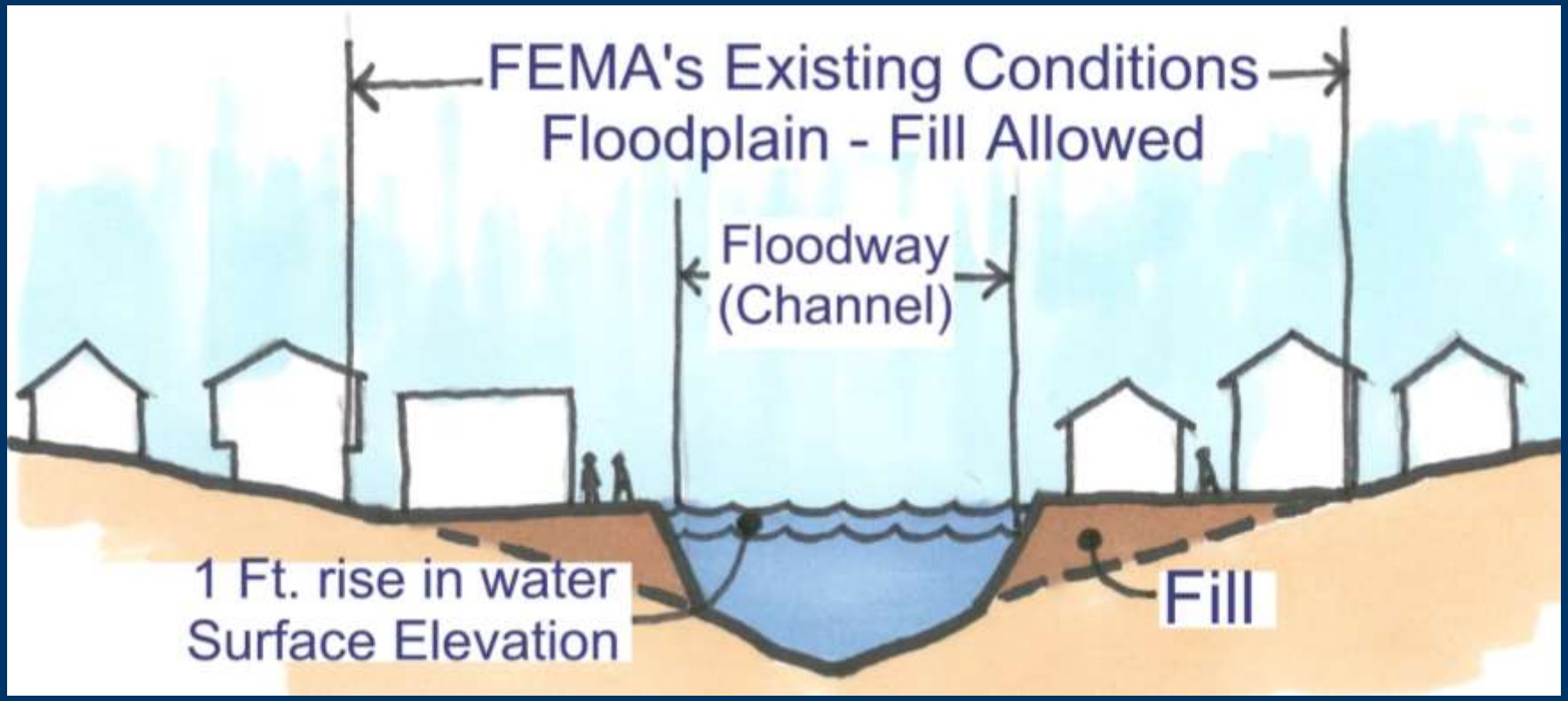
Today's Floodplain Is Not Necessarily Tomorrow's Floodplain



If large areas of the floodplain are filled, then there will be an increase in the land area needed to store flood waters. This means your home or business may be impacted.

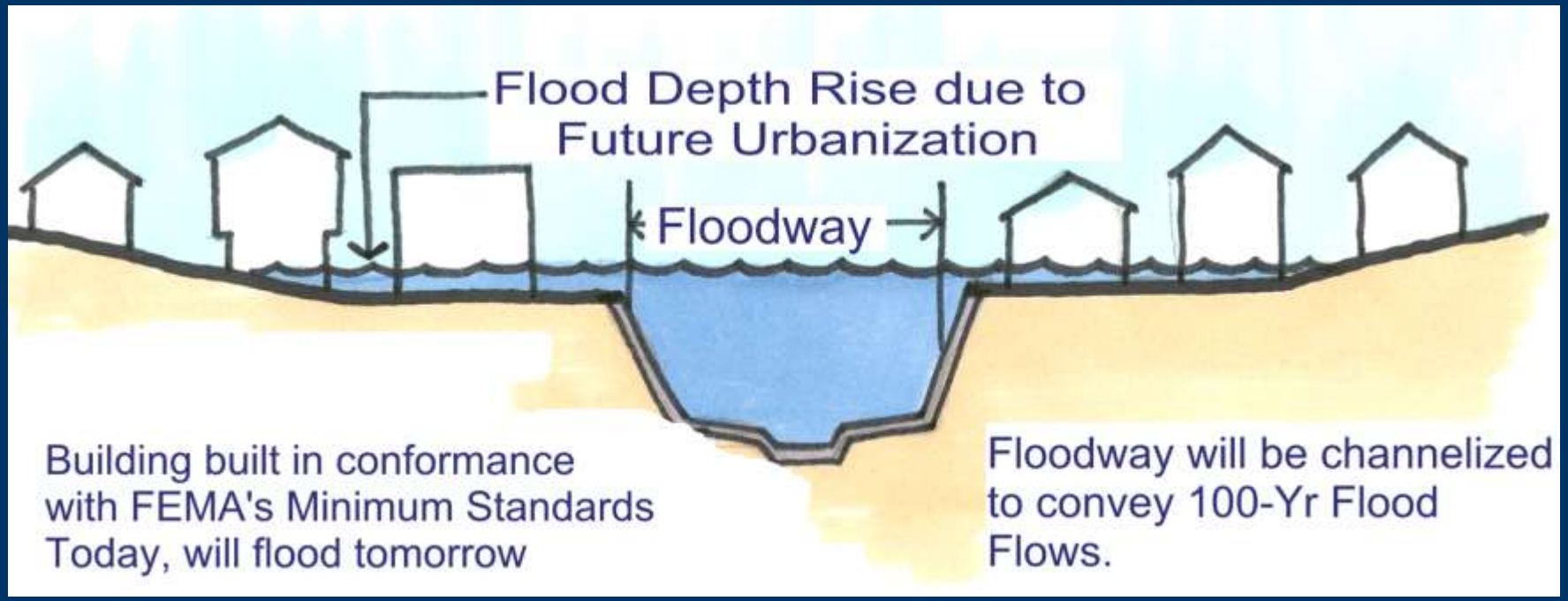


Unsuitable for a Developing Urban Watershed



Existing Conditions

Using FEMA's Minimum Standards will Result in a Channelized Floodplain

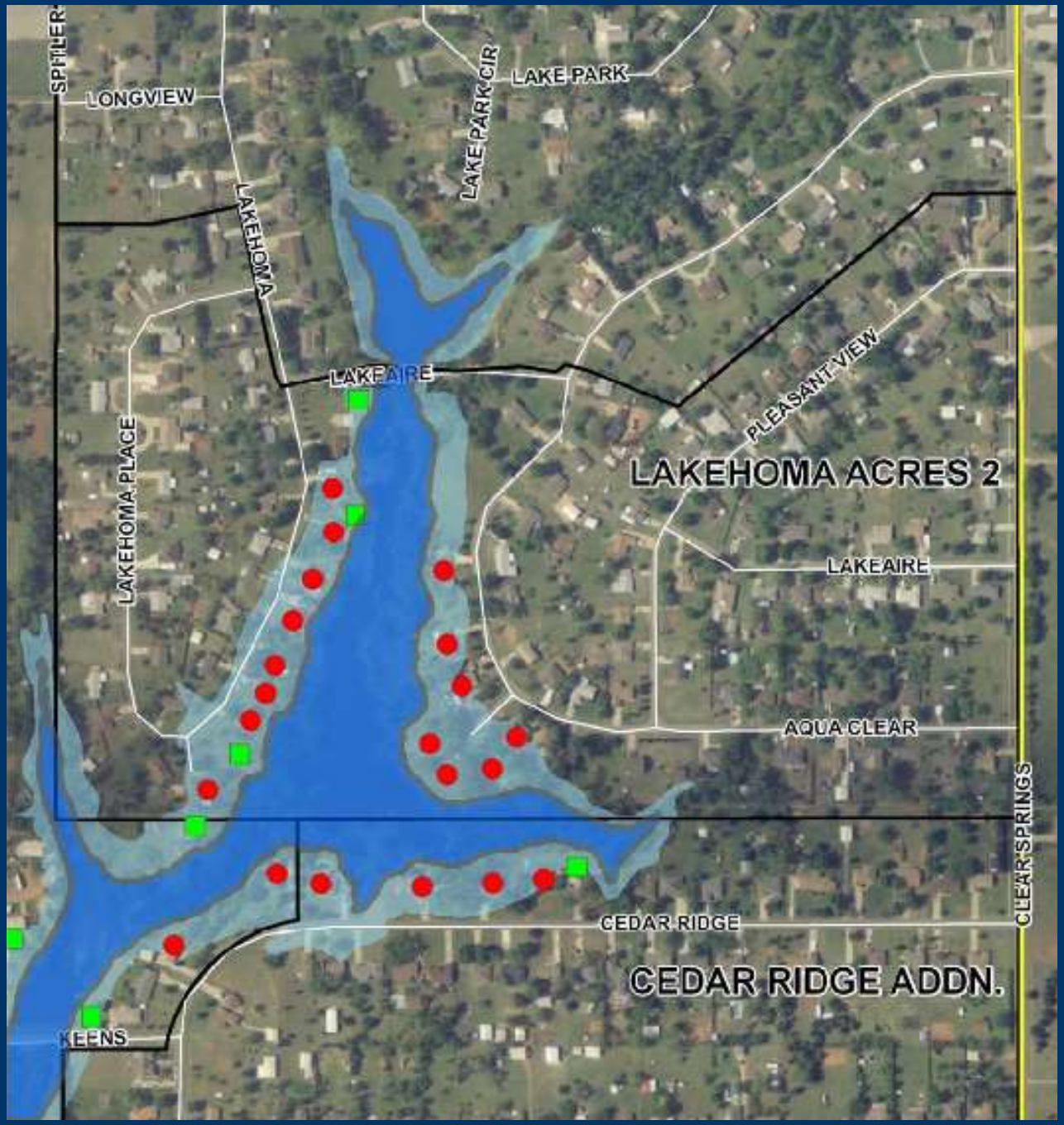


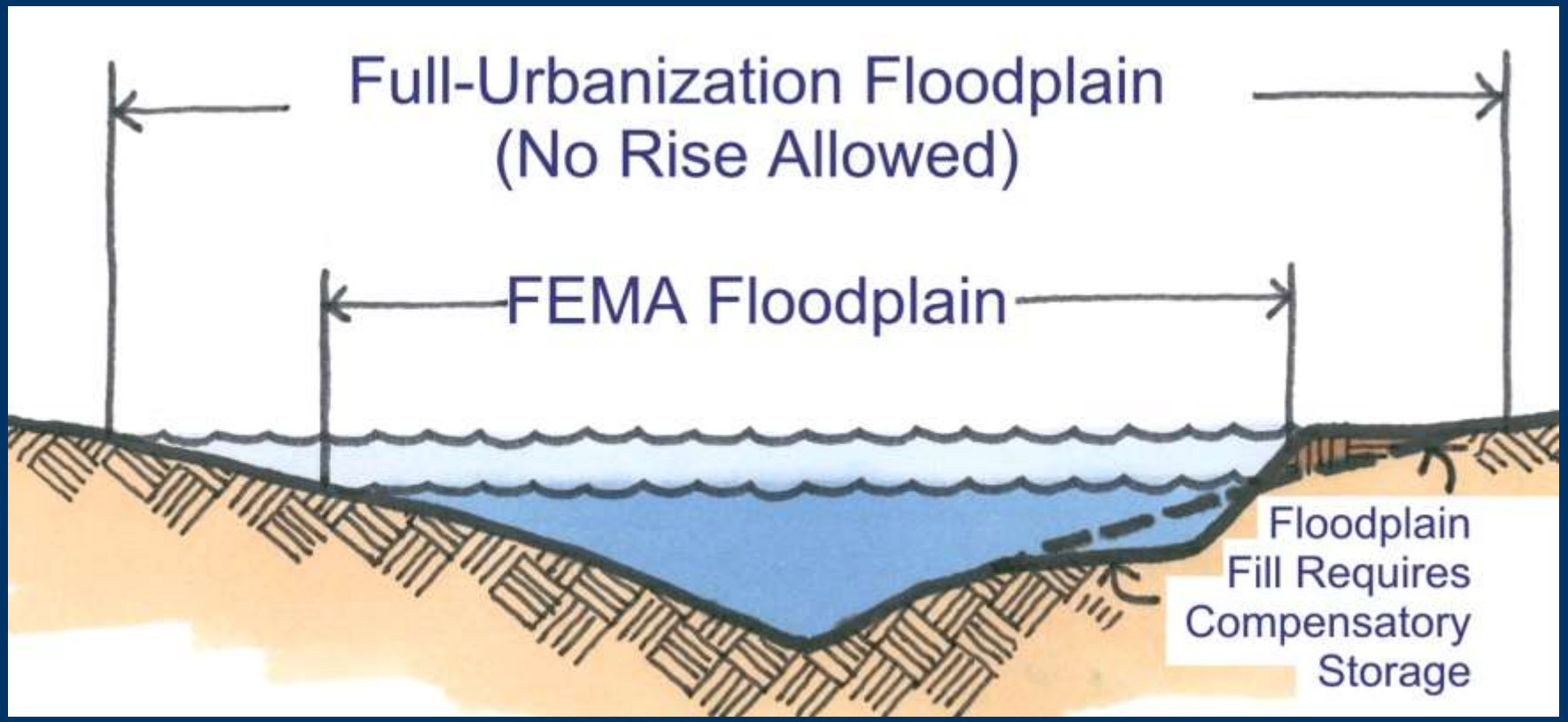
Future Conditions

Buildings Constructed in Compliance with NFIP Minimum Standards Today will be Under Water Tomorrow

100 yr. Floodplain

& Structures in the Floodplain





Recommended Urban Floodplain

Floodplain Fill and Upstream Urban Development will Significantly Increase Flood Discharges and Depths

Flood Facts

- ***US property damage from flooding totals over $1 billion each year***
- ***In most years, flooding accounts for or is involved with ¾ of Federal Disaster declarations***
- ***Flash floods can occur with little or no warning & reach full peak in a few minutes. Most flood deaths are due to flash floods***

In Oklahoma, in 2010

There were 21 Federal Presidential Disaster Declarations,

A record for the United States

Flooding is an Act of Nature

but…

Flood Damages are the Act of Man

Dr. Gilbert White

Current Approaches Create Future Disasters

If we continue to encourage at-risk development and ignore the impact to others, can we accept the consequences…

*… **and, are we willing to pay for it?***


THERE'S THE FLOODPLAIN. NOW WHERE DO WE GO FROM HERE?

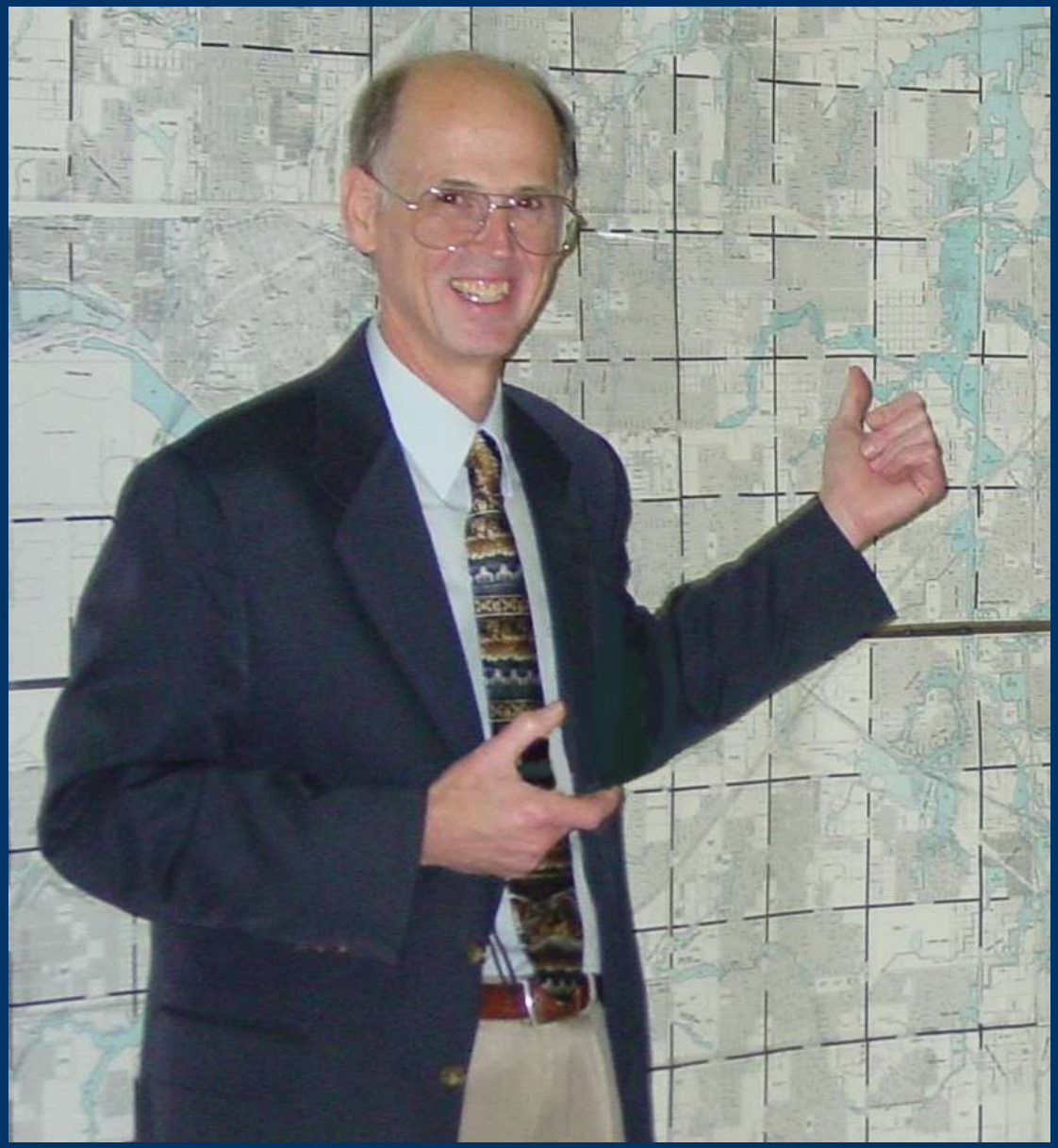
No Adverse Impact Roles

Local Government is the key

- Develop and adopt NAI community-based plans
- Adopt NAI strategies
- Educate citizens on the "Good Neighbor Policy"

Hazard Identification

- Use a comprehensive approach
- Reflect future conditions
- Identify hazards not mapped by FEMA



French Wetmore
CRS Consultant

The Community Rating System (CRS)

is the preferred tool to assist communities to advance beyond the NFIP Minimum Standards, and reduces Flood Insurance Rates for Homeowners

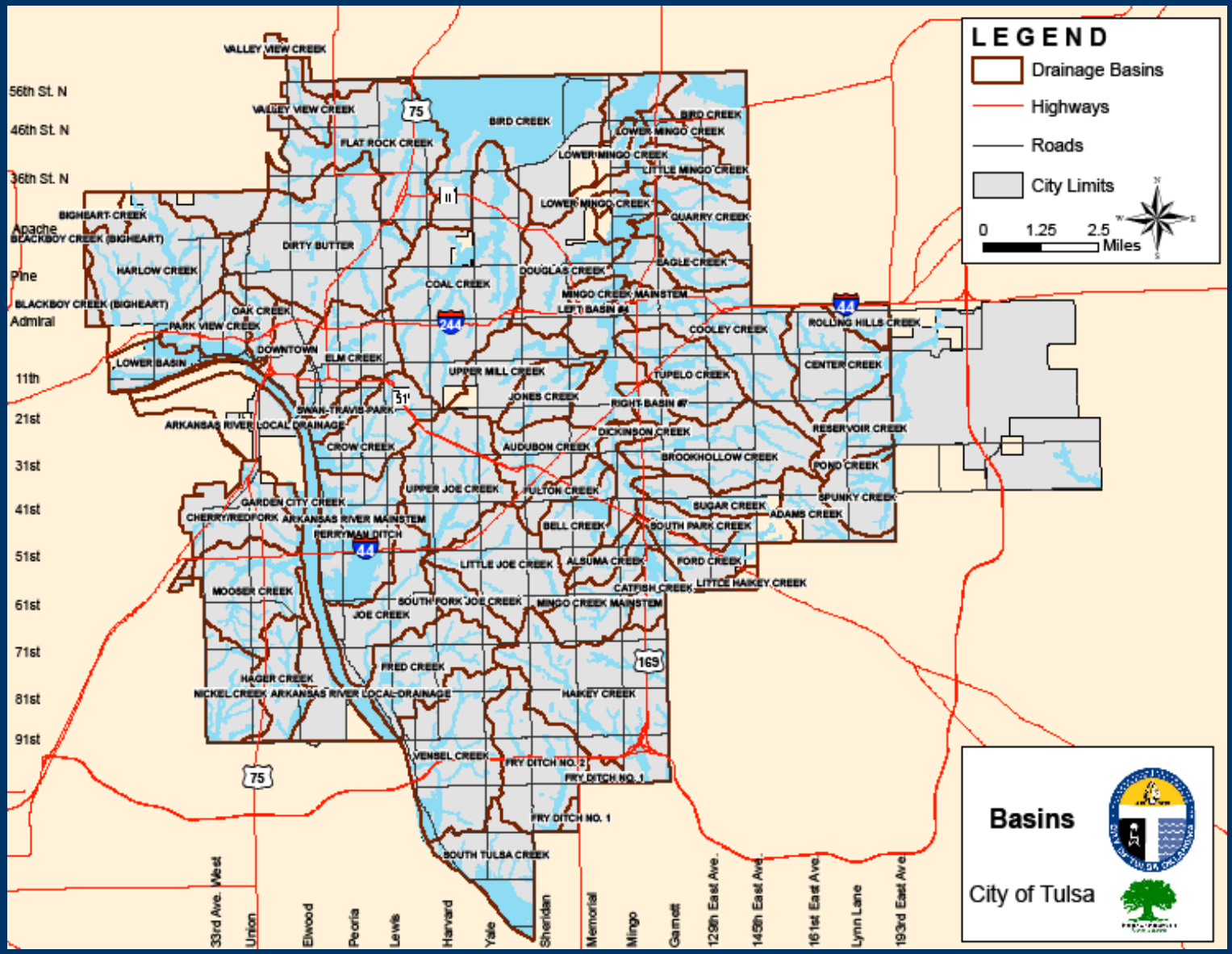
Comprehensive Basin-wide Master Drainage Planning

Ken Wright, P.E.

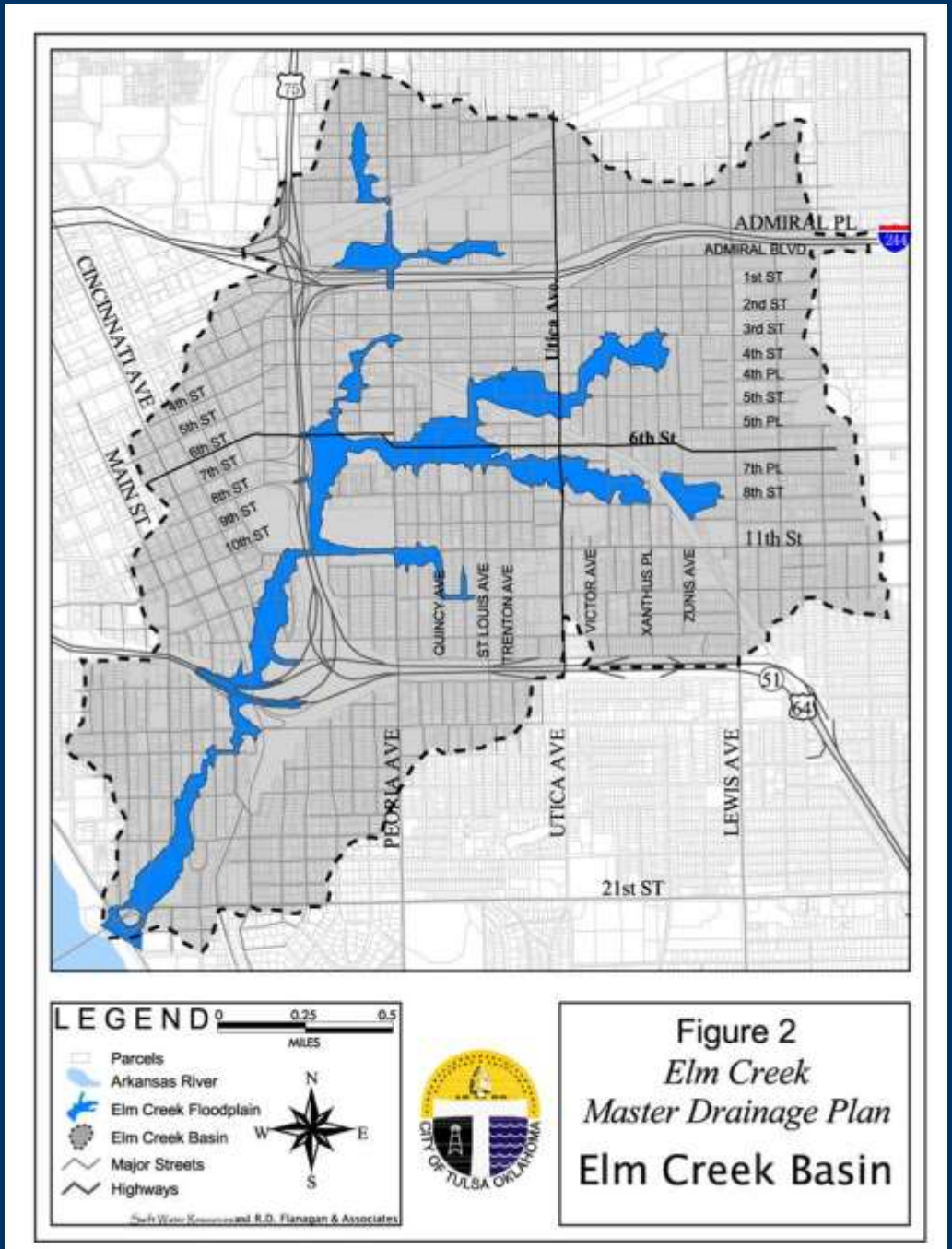
Wright Water Engineers
Denver, Co

Pioneers in Non-Structural, Multi-Objective, Urban Open-Space Floodplain Planning & Engineering

Plan & Vision for the Mingo Creek Greenway and Trail System



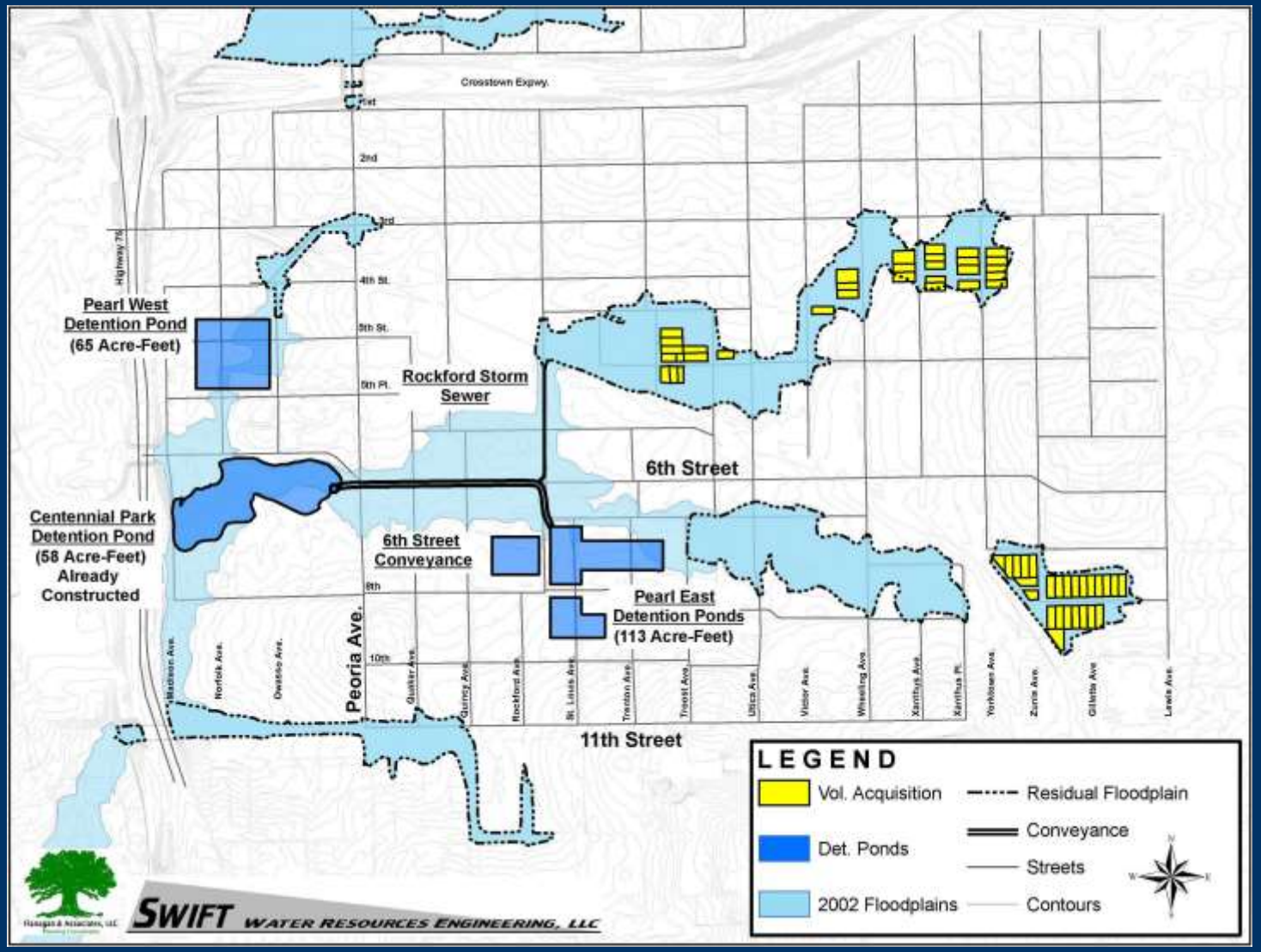
City of Tulsa Drainage Basins



3.4 square miles – Fully Urbanized –

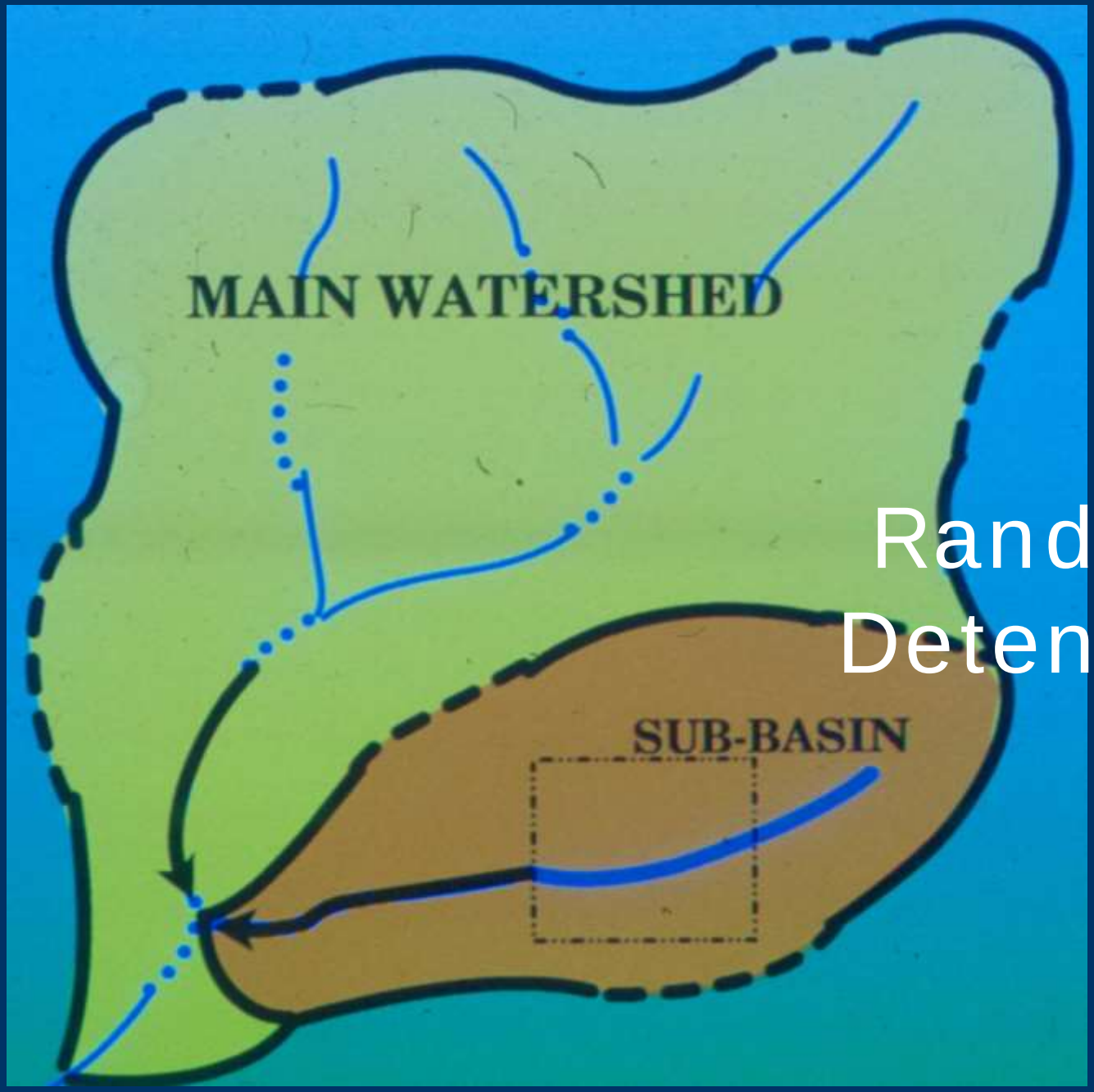
524 Structures in Floodplain

Elm Creek – 2008 MDP Update

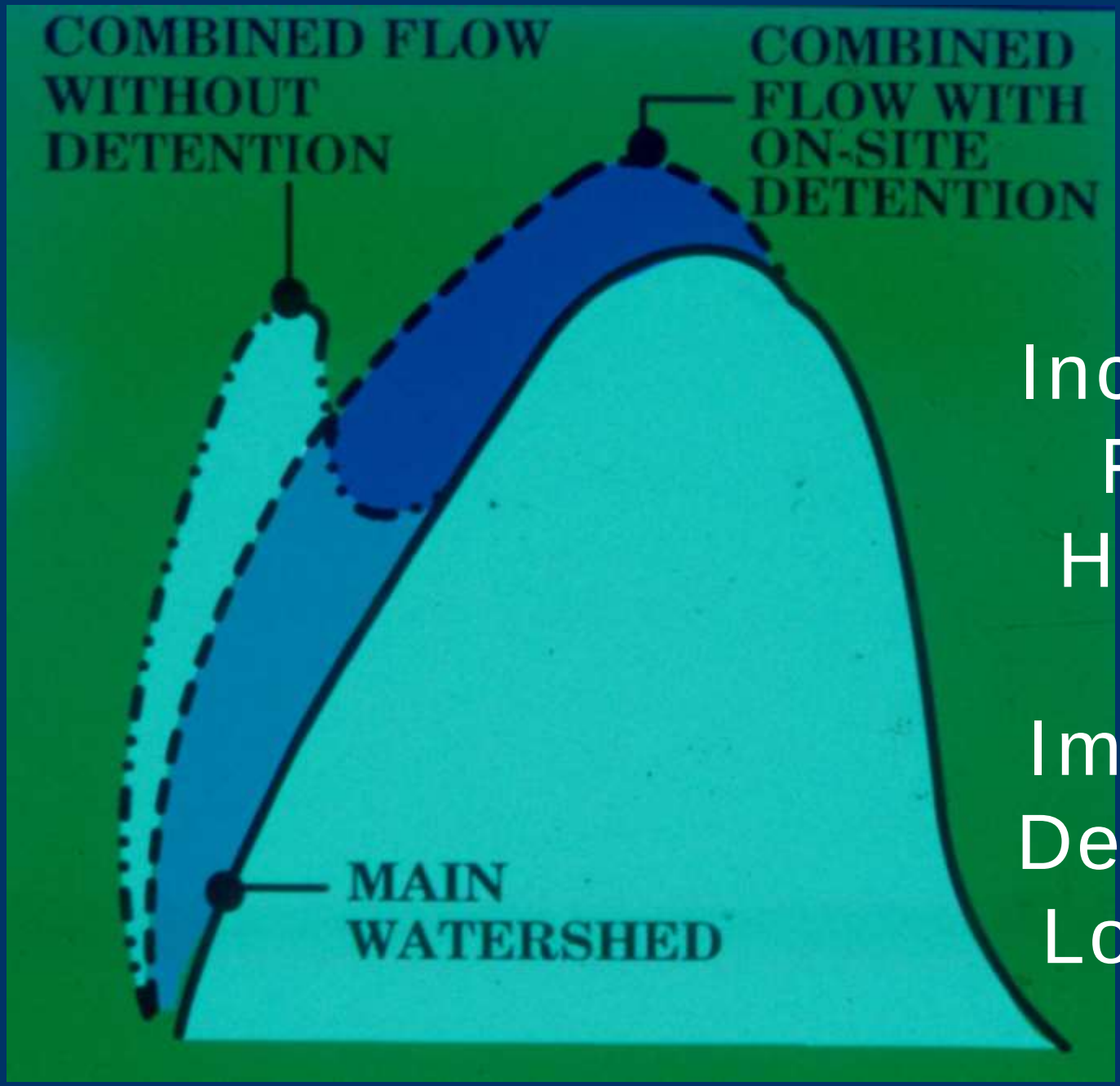


Recommended Plan

3 Detention Ponds, Conveyance Feature, Limited Acquisition



Random Detention



Increased Flood Heights with Improper Detention Location

Overland Flow

Stormwater and Floodplain Management begins at the Subdivision and Lot Site Design level

Stormwater Law

- **OKLAHOMA CITY V. BETHEL, 175 OKLA. 193. 51 p. 2d 313 (1935):**

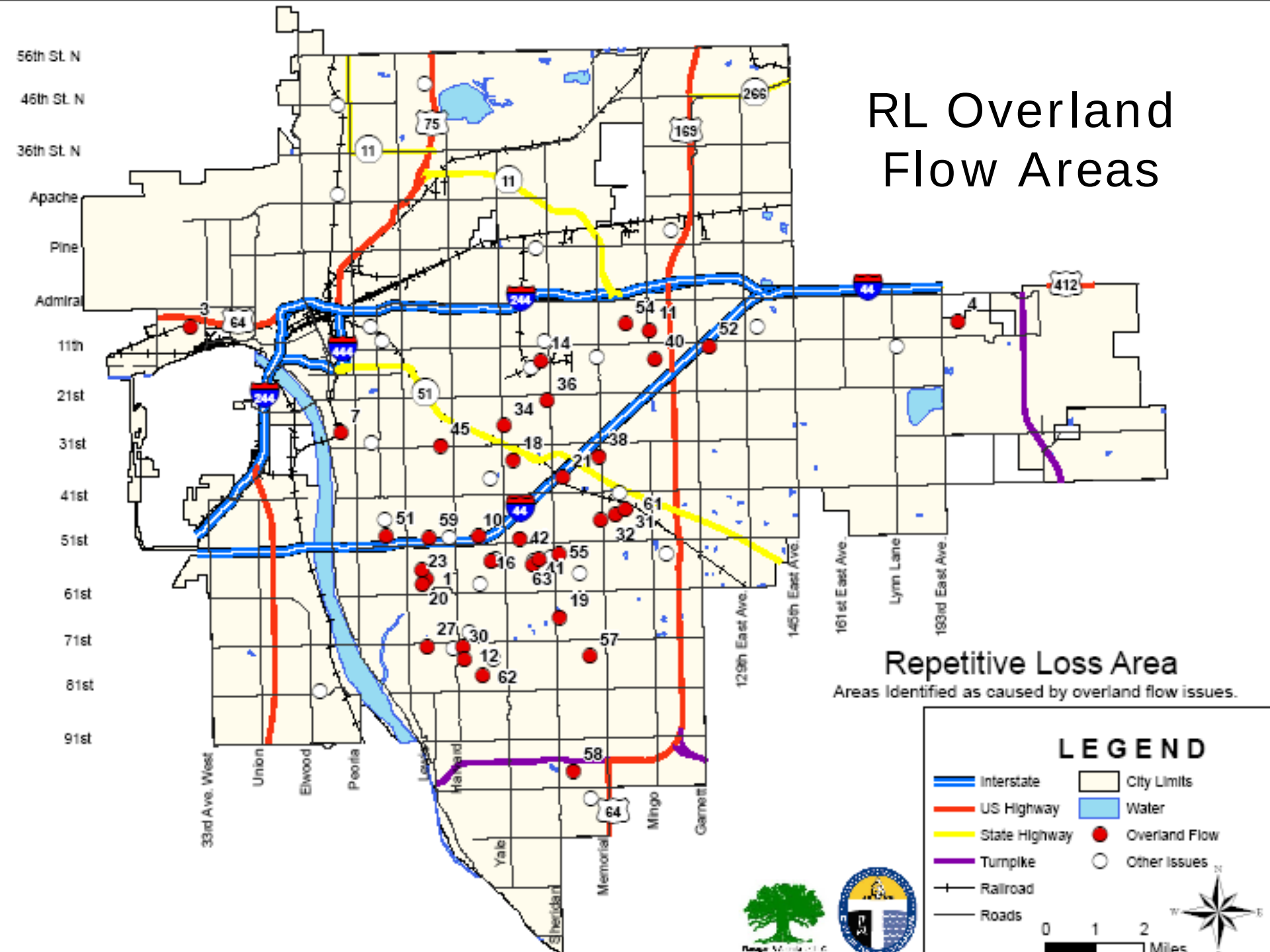
- "City has no right to collect water by artificial means and permit it to be discharged in greater volumes or velocity than would naturally flow."

The Urban Dilemma:

How do you double the Natural Runoff Discharge & Volumes, and have NO Adverse Impact on downstream property owners?

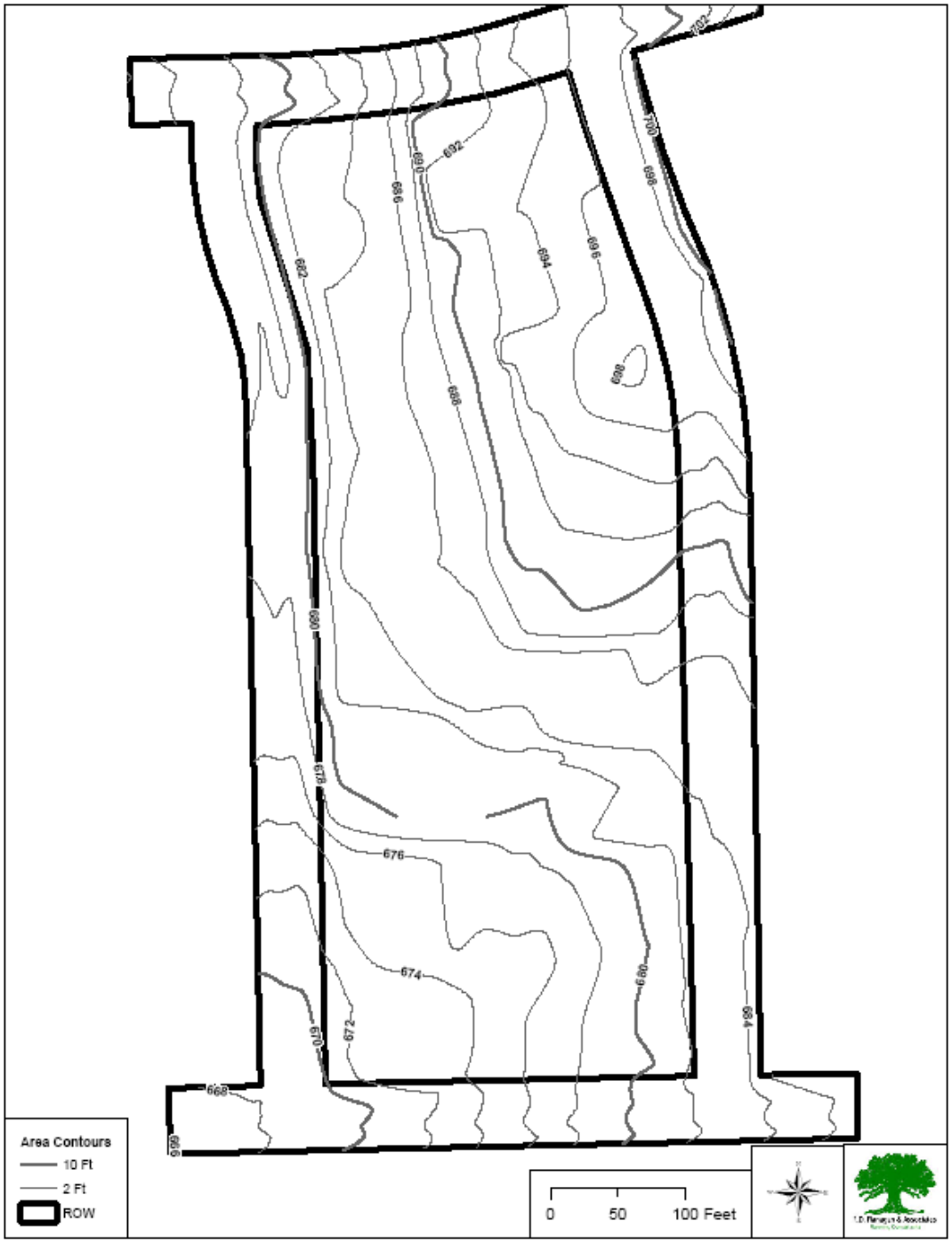
Over 1/3 of all Flood Insurance Claims are NOT Located in the Floodplains.

Most Drainage-Related Damages are Unreported and are from Overland Flow


RL Overland Flow Areas
56th St. N
46th St. N
36th St. N
Apache
Pine
Admiral
11th
21st
31st
41st
51st
61st
71st
81st
91st
33rd Ave. West
Union
Elwood
Peoria
Lewis
Harvard
Yale
Sheridan
Memorial
Mingo
Garnett
129th East Ave.
145th East Ave.
161st East Ave.
Lynn Lane
193rd East Ave.
Repetitive Loss Area
Areas Identified as caused by overland flow issues.
LEGEND
Interstate
US Highway
State Highway
Turnpike
Railroad
Roads
City Limits
Water
Overland Flow
Other Issues
0 1 2
Miles

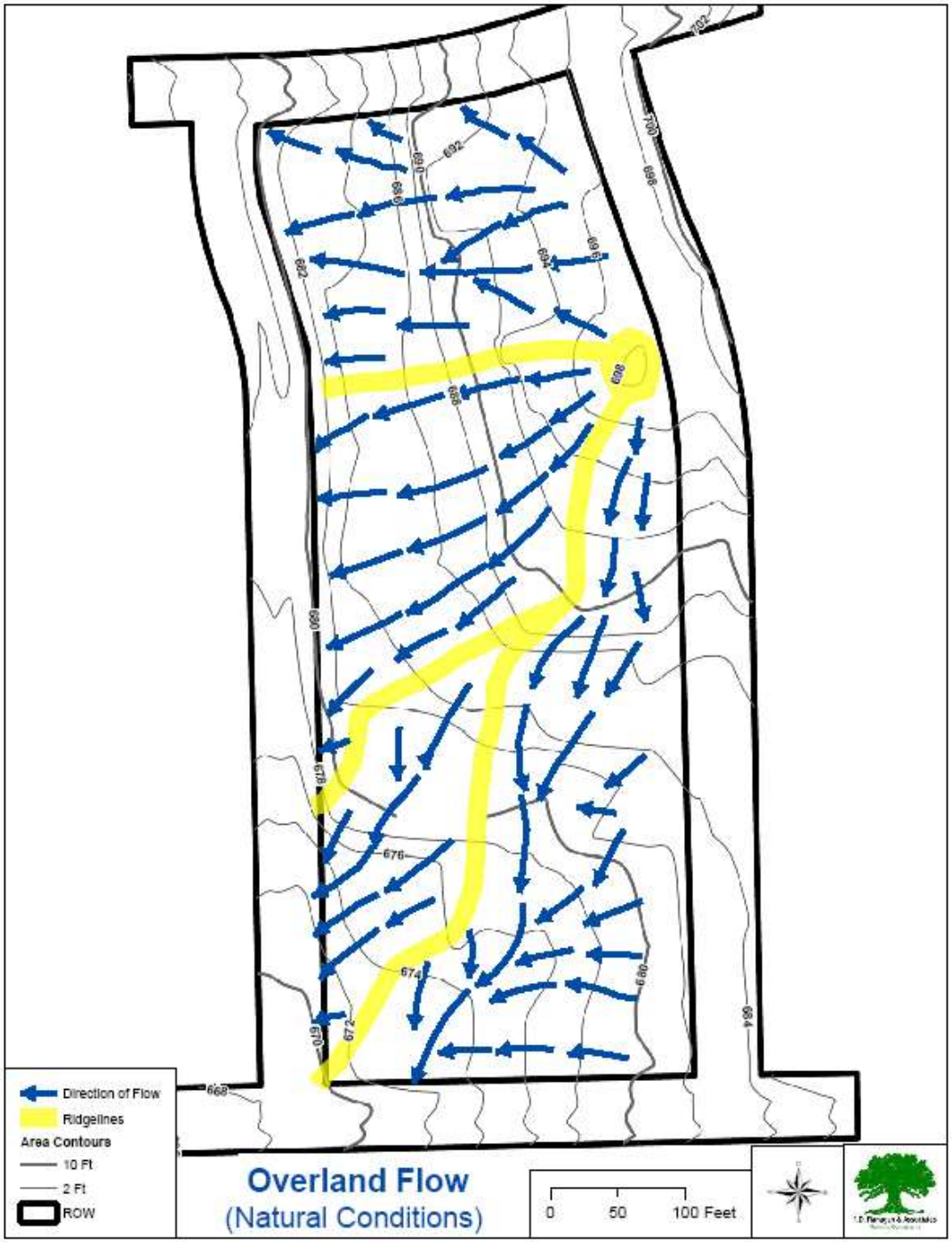
Requirements for a Successful Stormwater/Floodplain Management Program

1. Event
2. Media
3. Citizens Involvement & Participation
4. Subject Professionals
5. Staff
6. Elected Official Champion
7. Government Regulations
8. Professional Associations

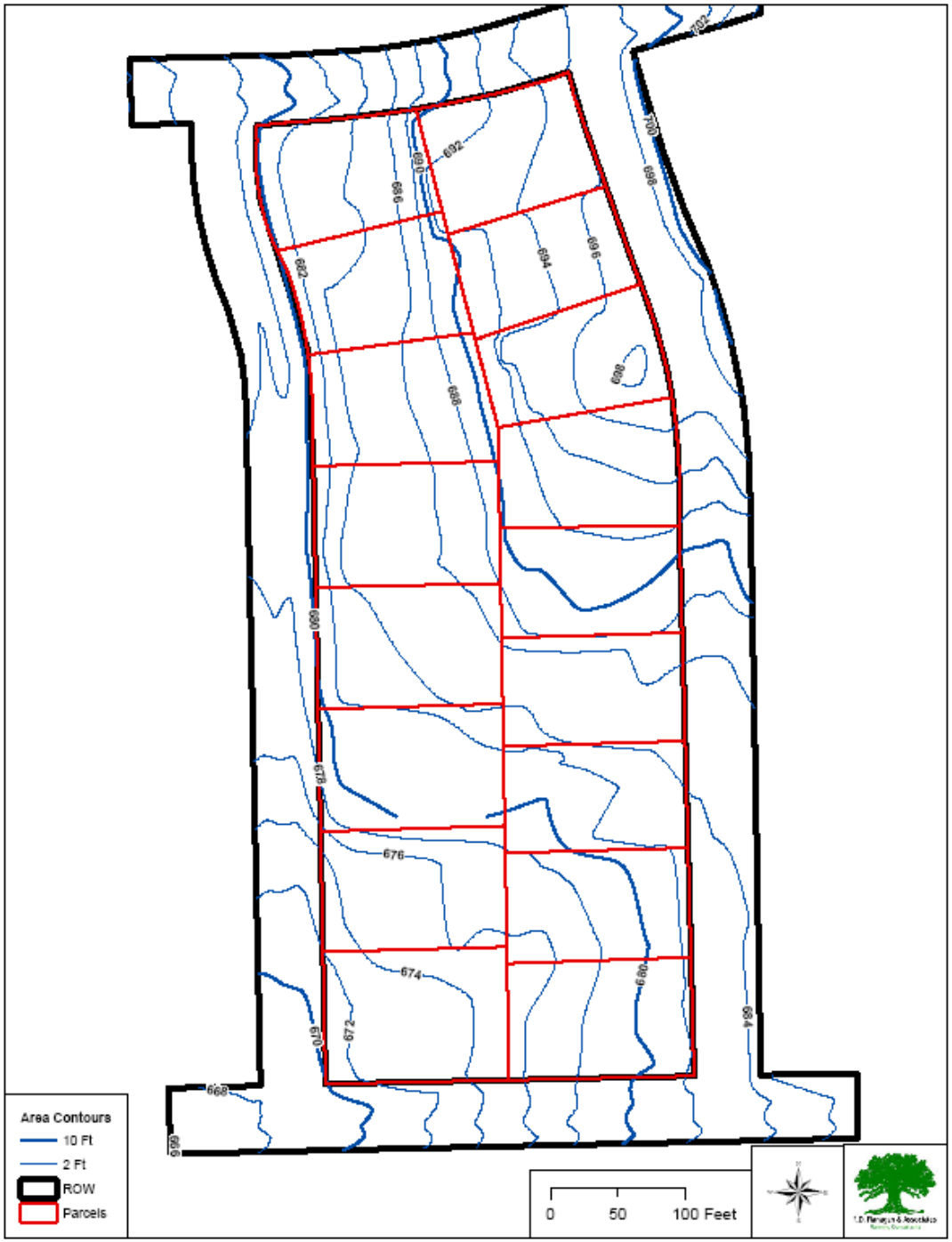


Block Base Map

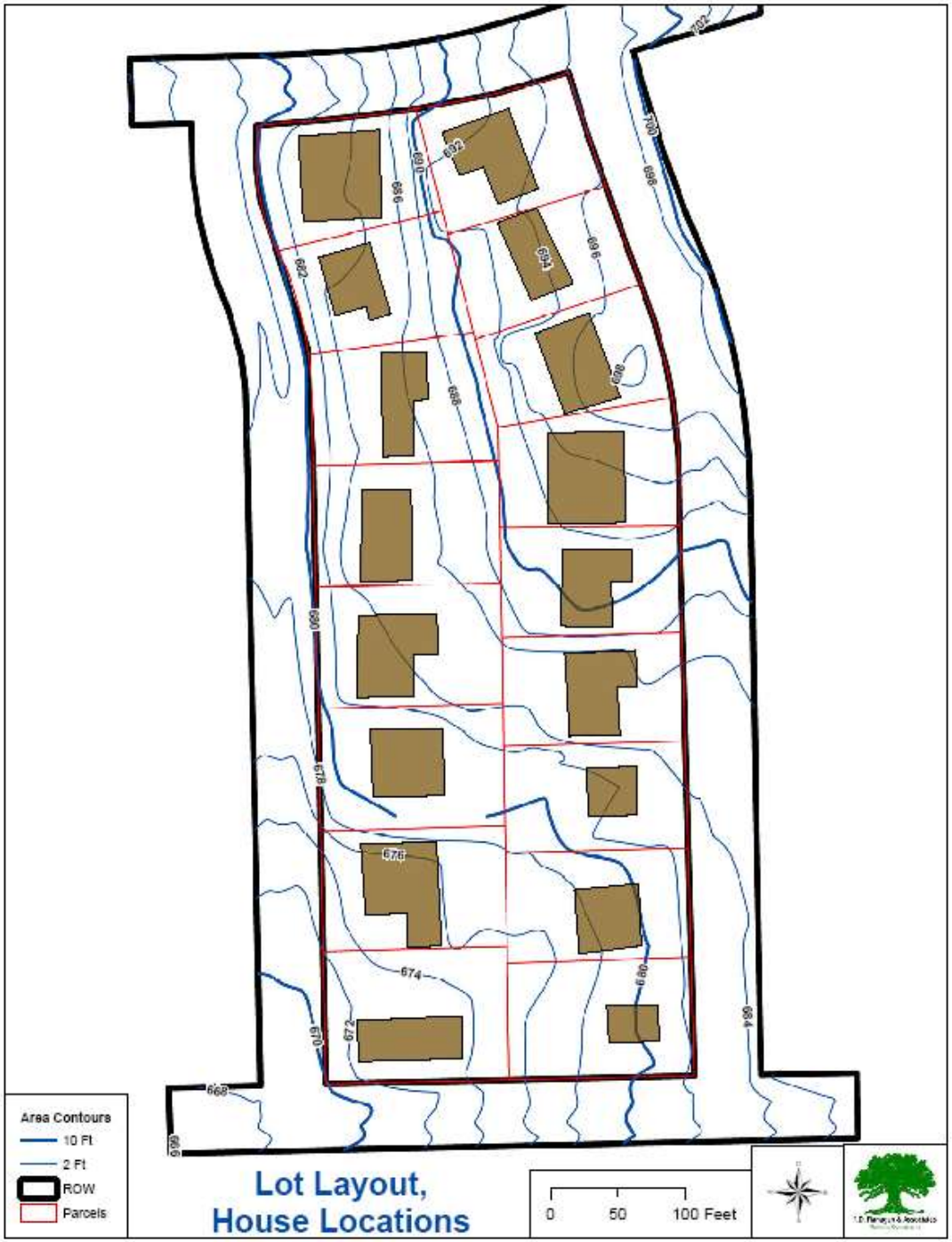
2 ft. Contours



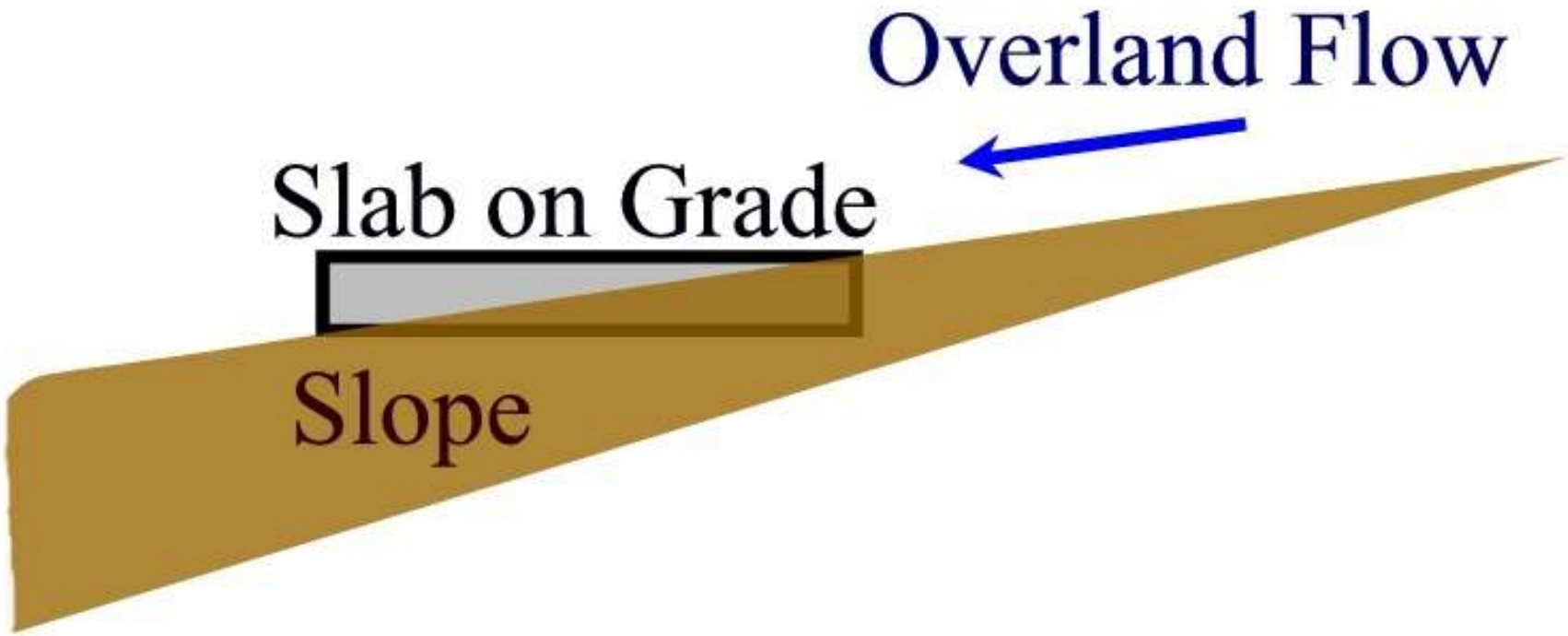
Natural Overland Flow Patterns



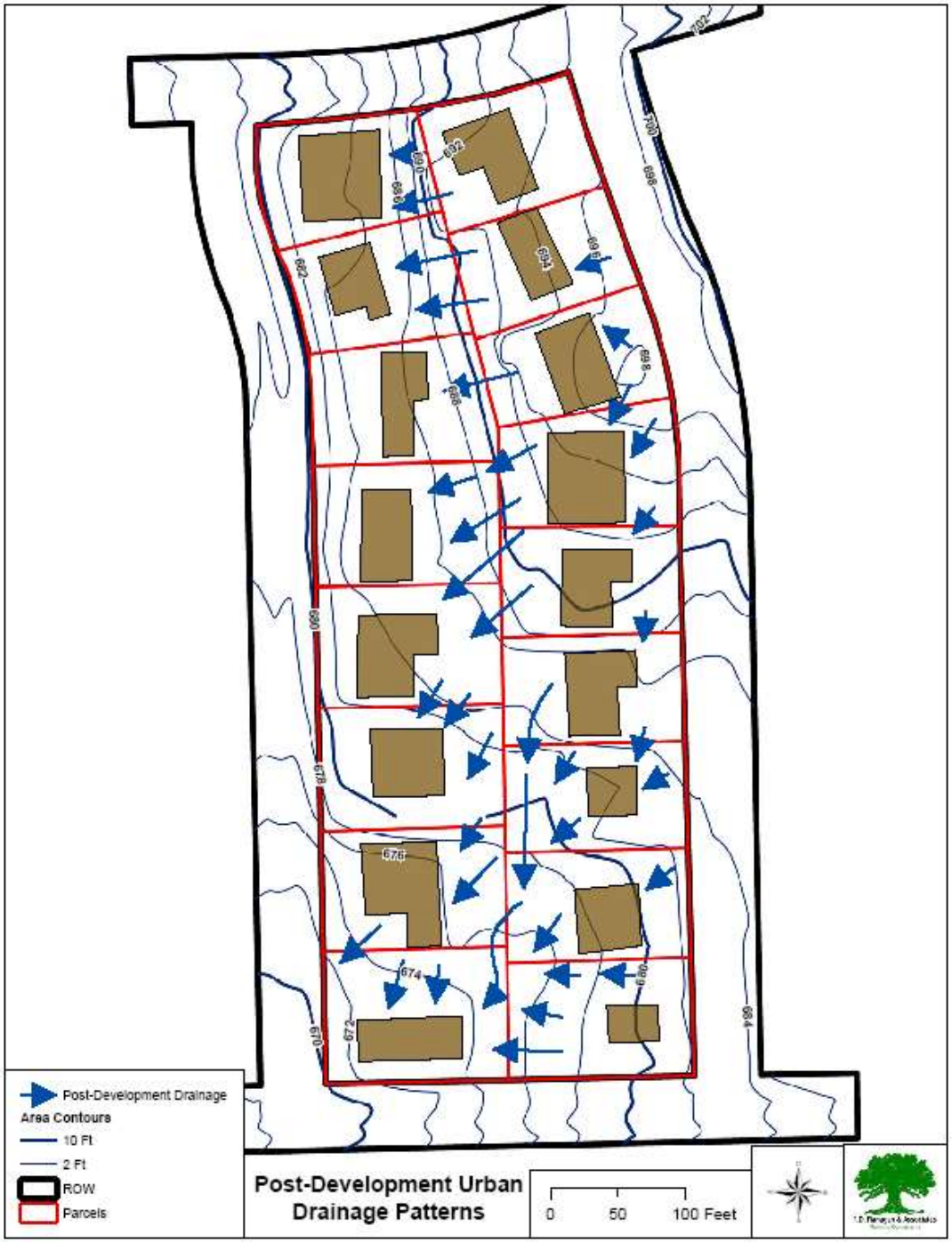
Subdivision Lot Lines



Typical Structure Placement



Typical Slab-on-Grade Foundation



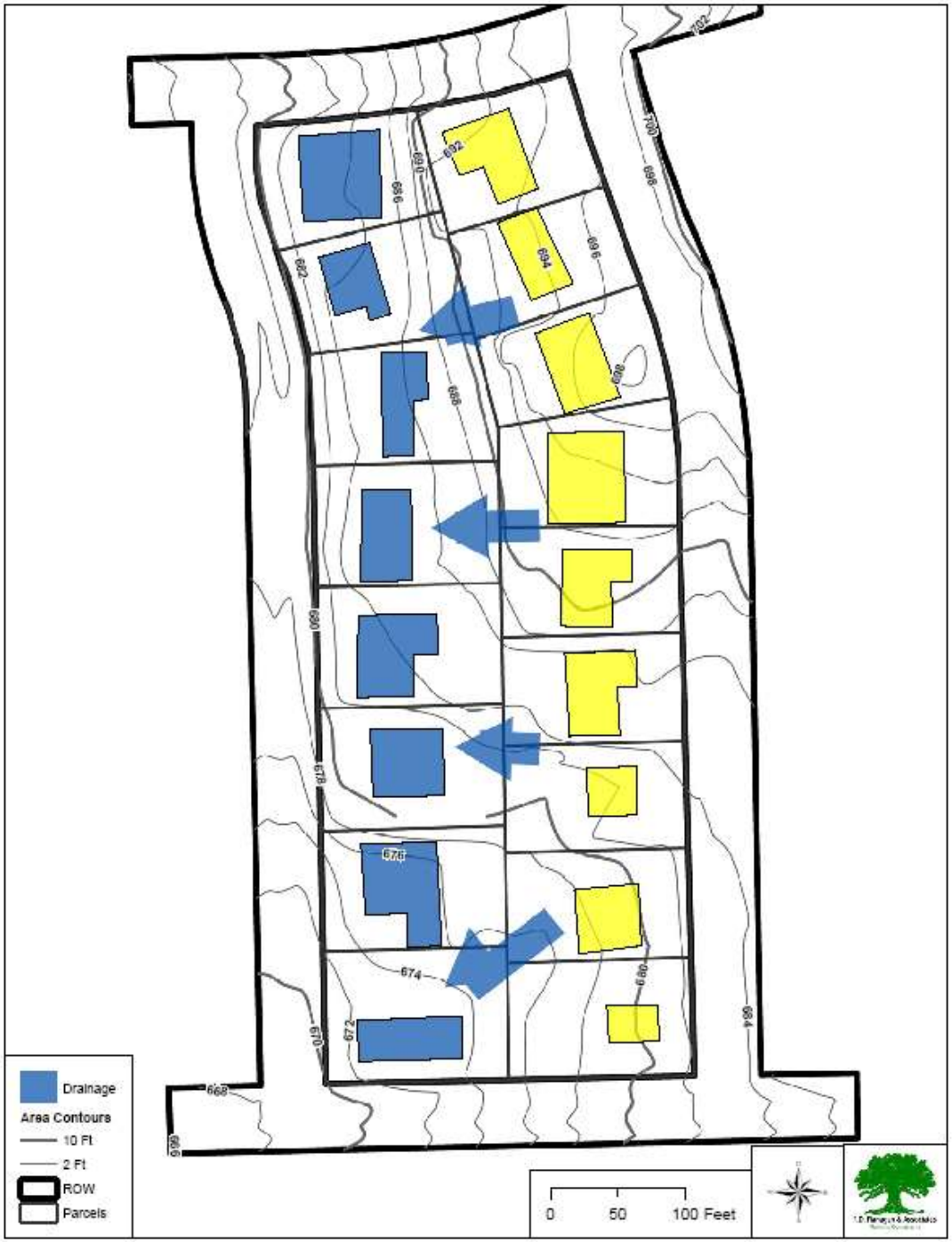
Post Development Urban Drainage Patterns

Typical Subdivision Overland Flow Drainage Patterns

Typical Backyard Overland Flow

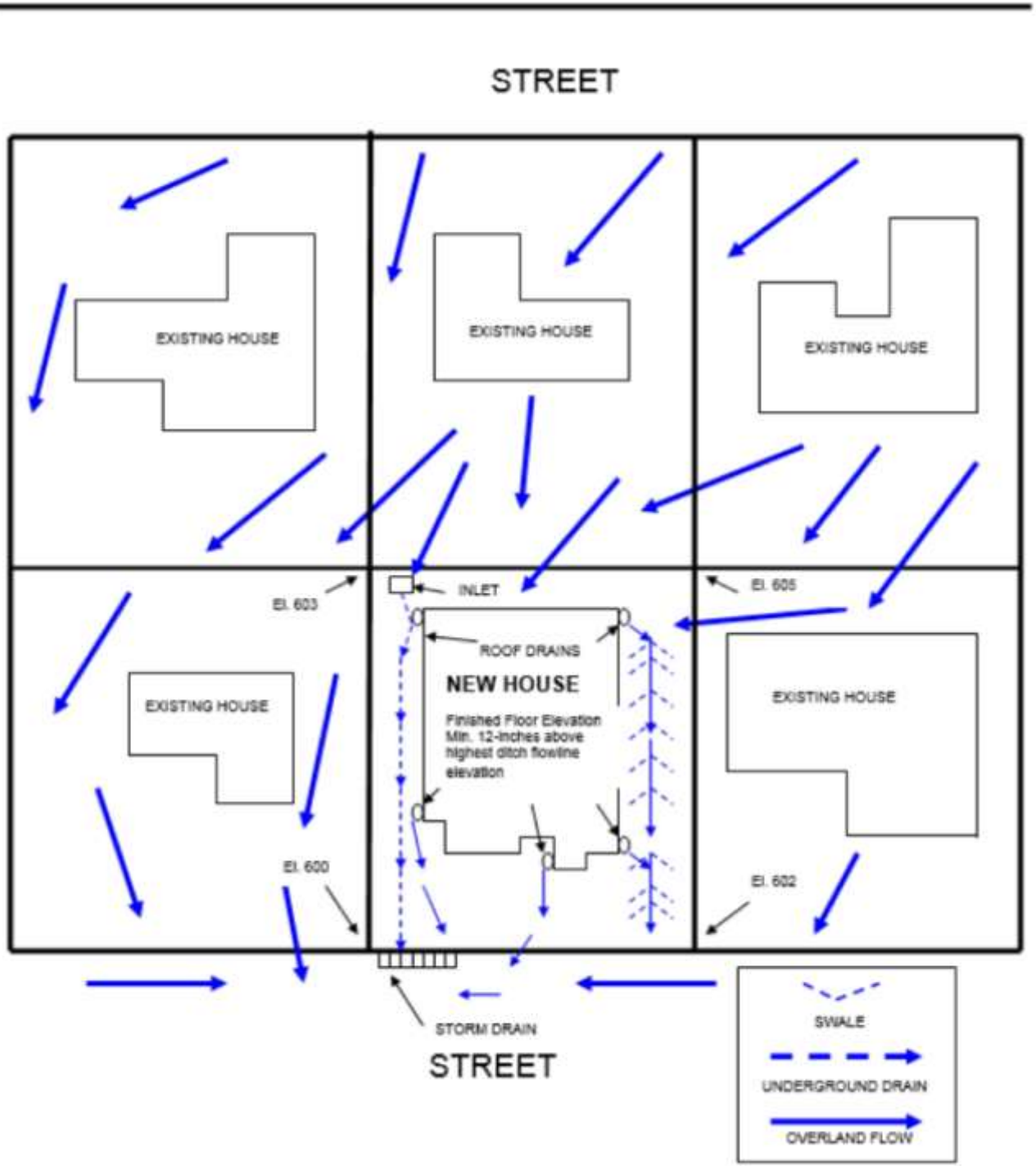

Overland Flow Drainage
Slab at Grade


7824
7825

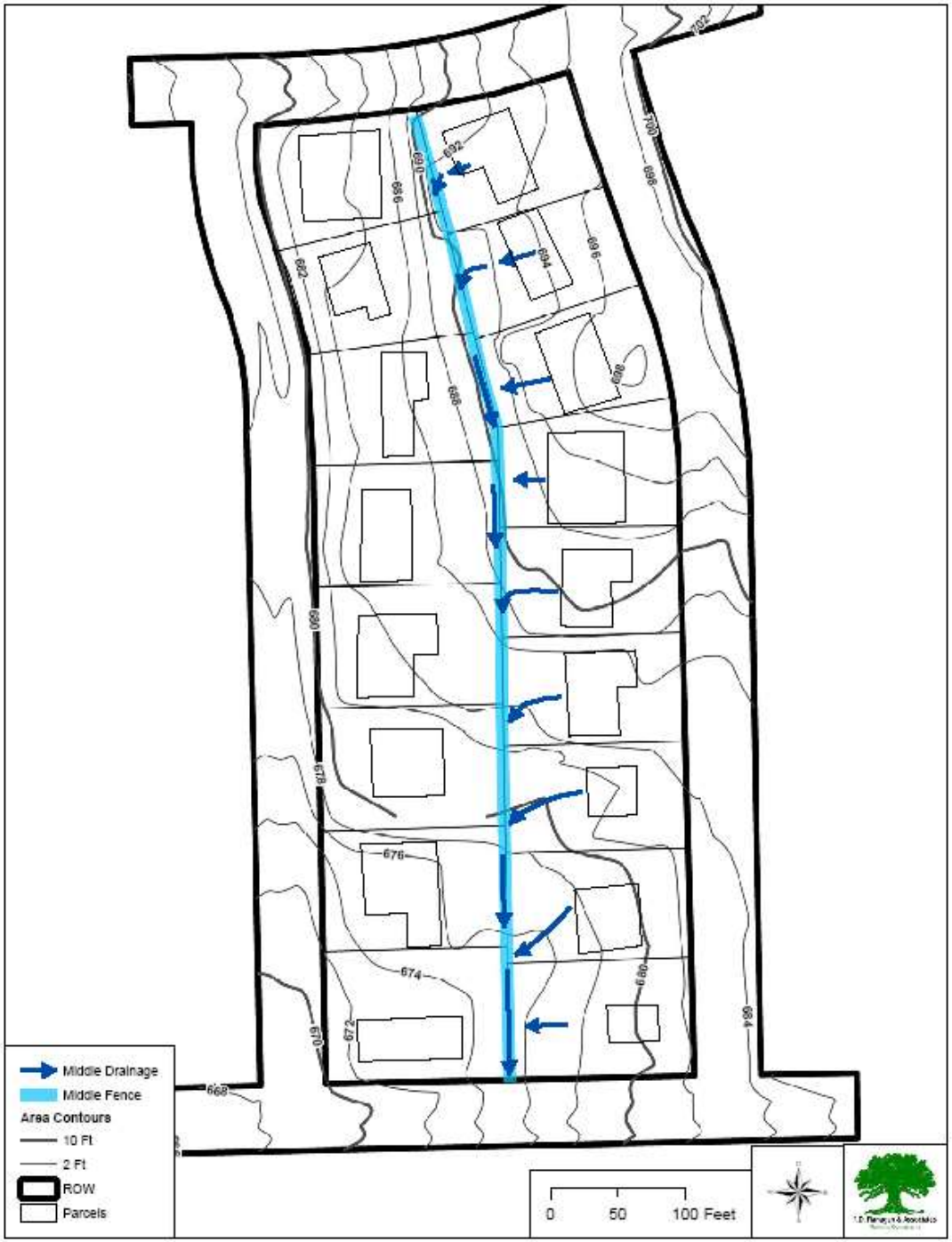


Problem:

Upstream Houses Flooding Downstream Homes

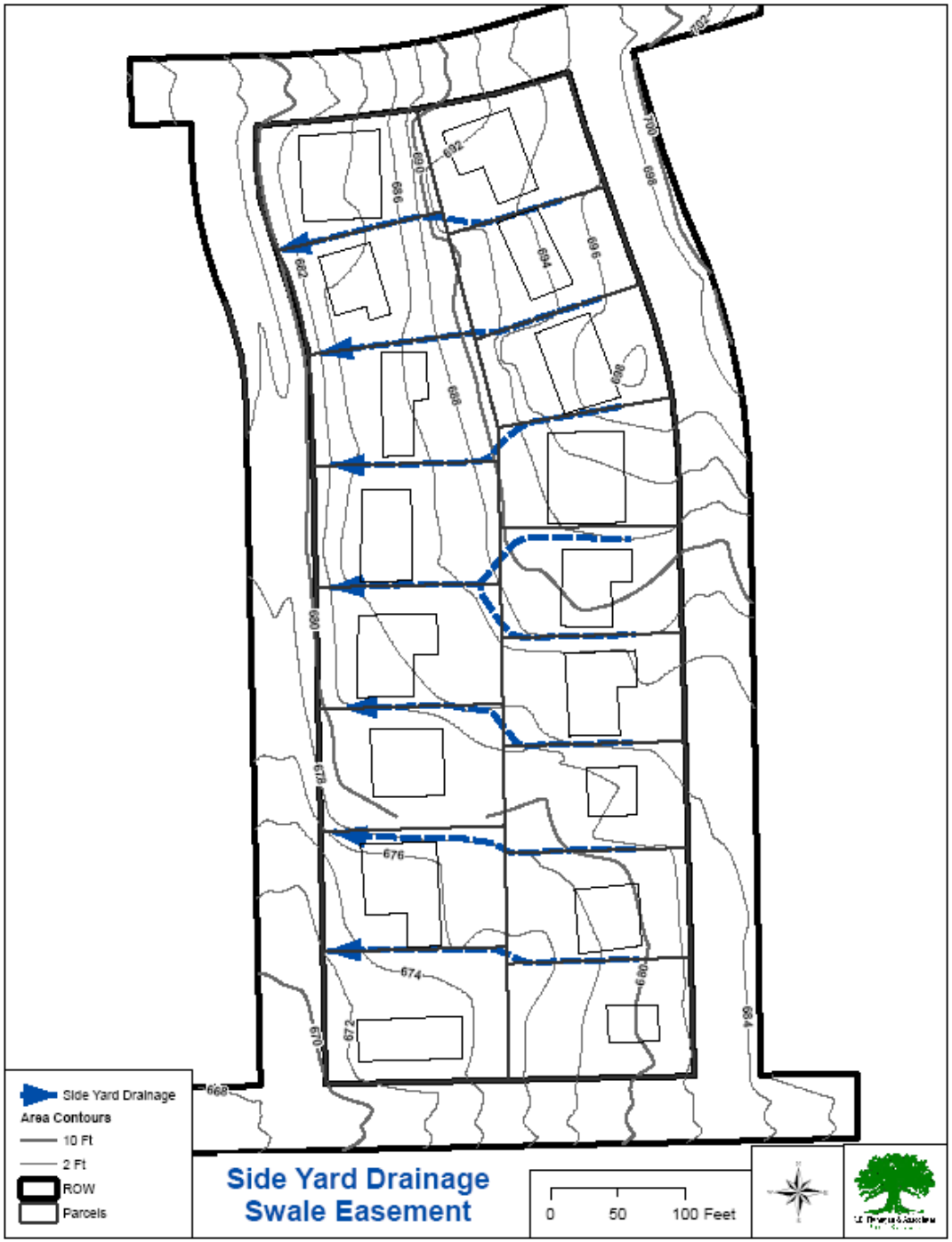


Subdivision Overland Flow Drainage Patterns



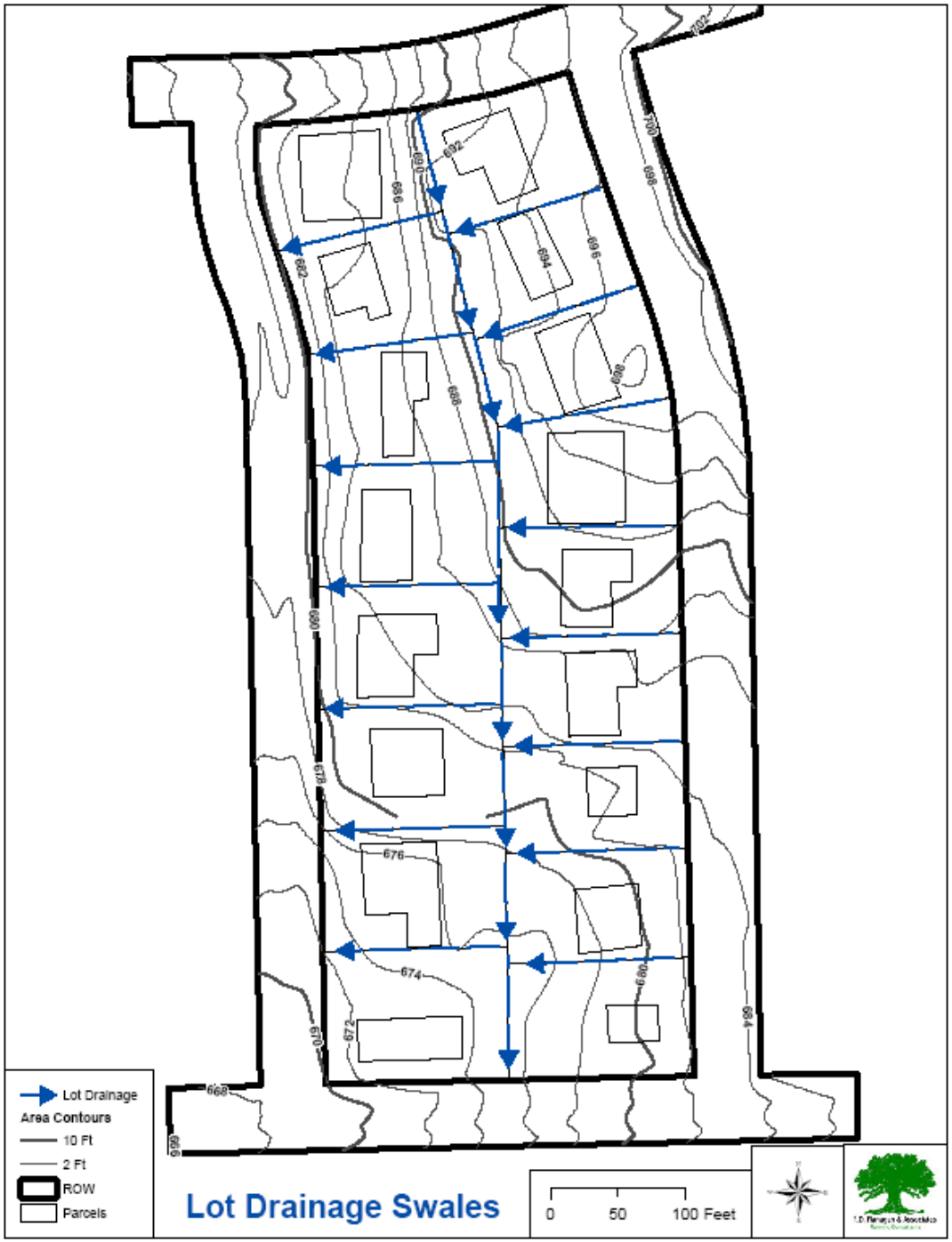
Solution:

Rear Lot Line Drainage Swale



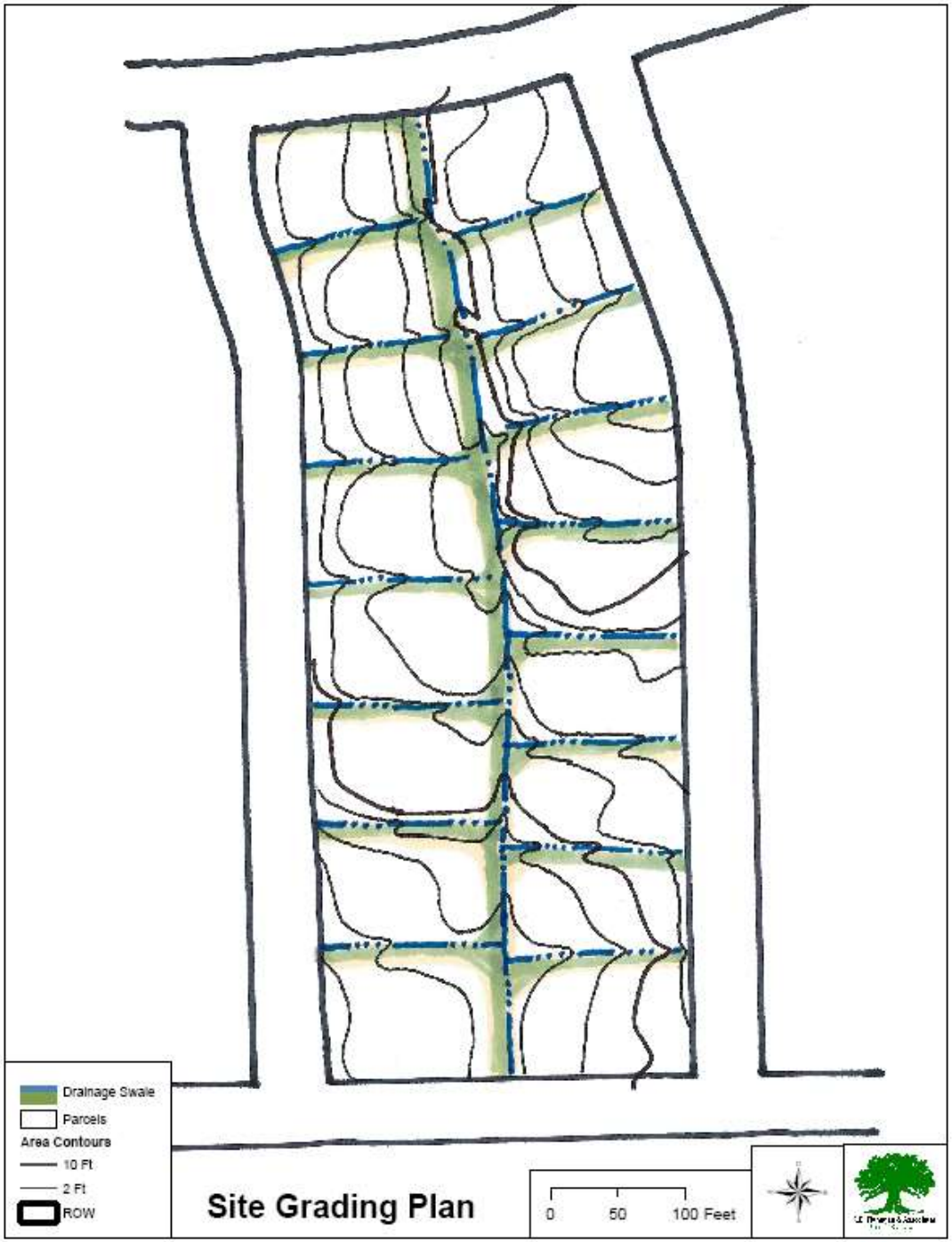
Solution:

Side Yard Drainage Swales



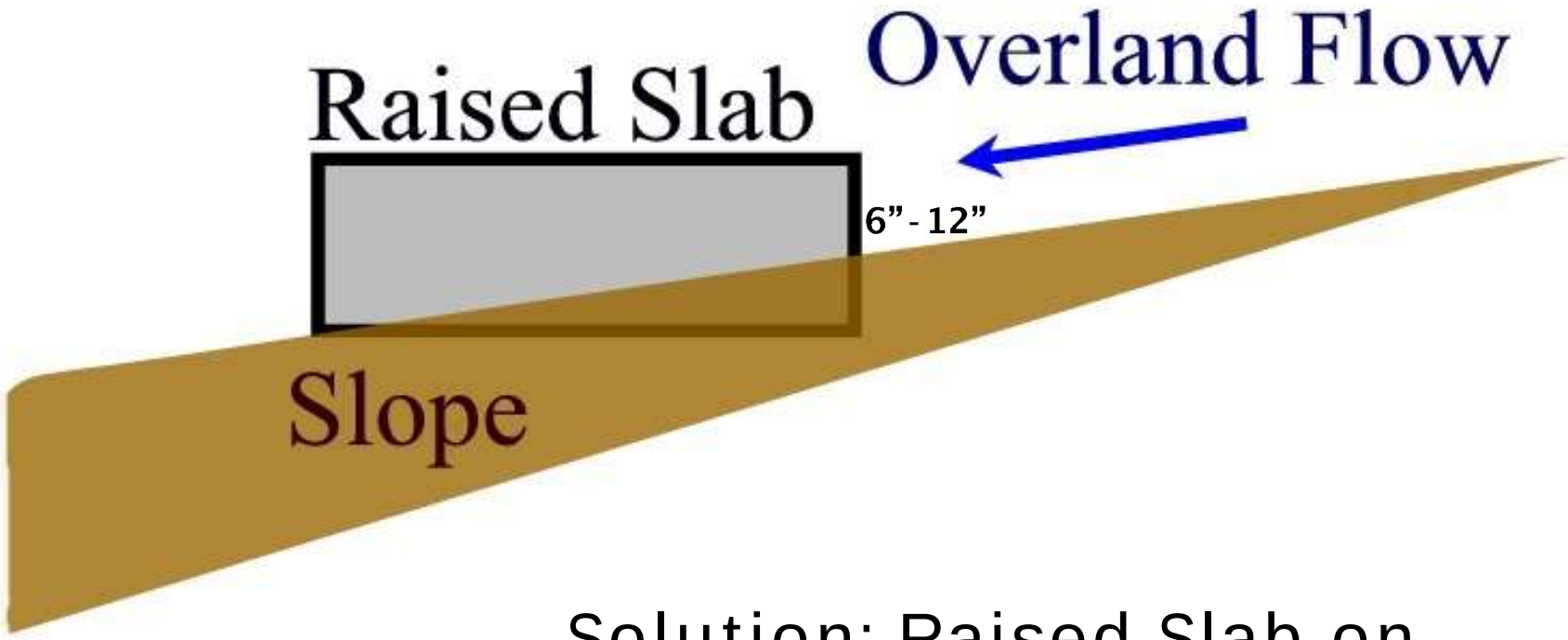
Solution:

Side Yard
&
Rear Lotline
Drainage
Swales

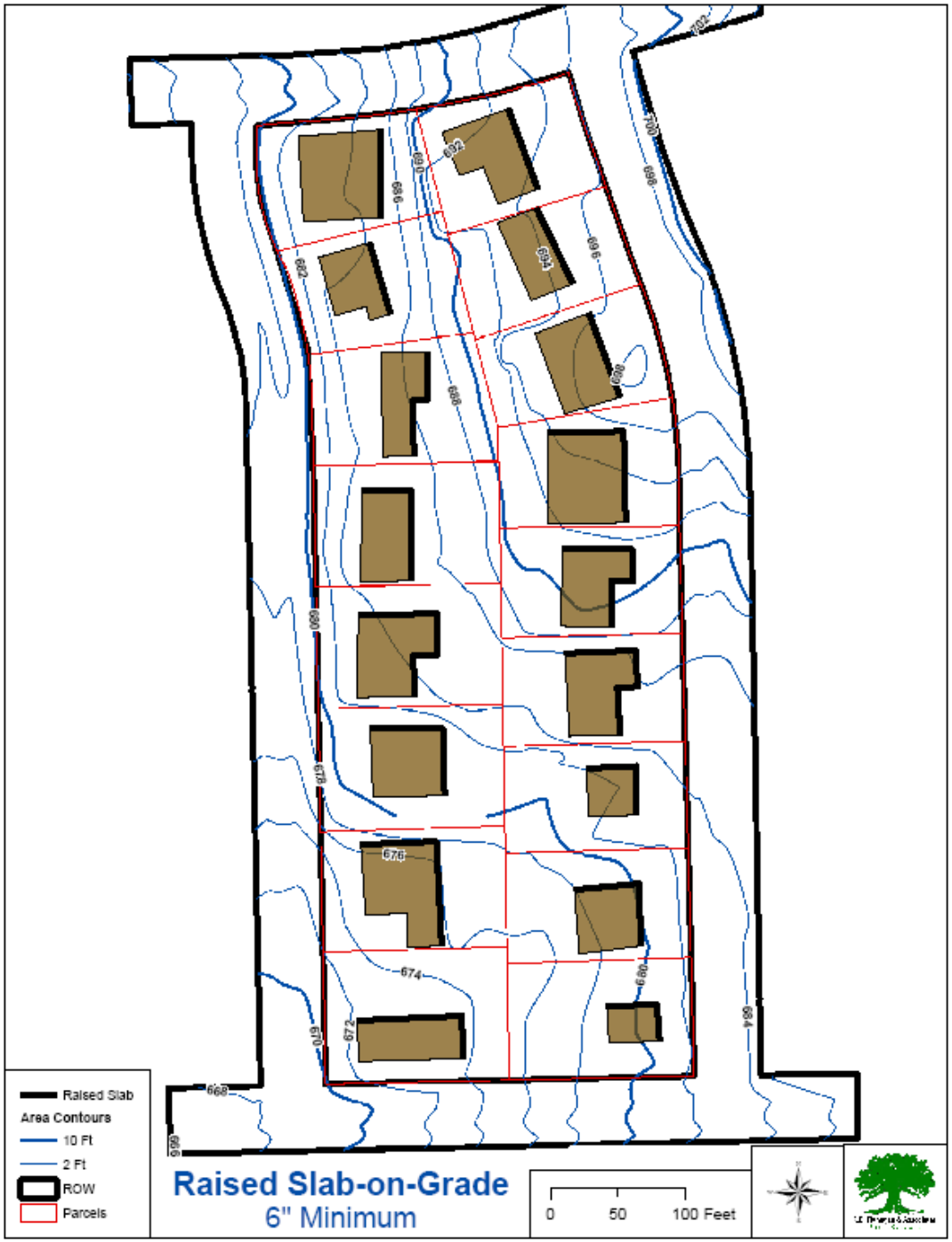


Overland Swales Site Grading Plan

Slab Raised 6” - 12” above
Upstream Flowline



Solution: Raised Slab on Upstream Side



Solution:

Raised Slab-on-Grade **6” Minimum**

City of Tulsa Skyline from Centennial Park

The Public enjoying a Properly Planned & Designed Stormwater Detention Facility


A Multi-Purpose Facility
Everyone can Enjoy

Consider the Natural and Beneficial Uses of the Floodplain

Floodplains are Best Suited for Urban Park & Recreation

Properly Planned Floodplains can be Enjoyed by the Entire Community

A Thing to be Enjoyed Forever

For Generations to Come

The End