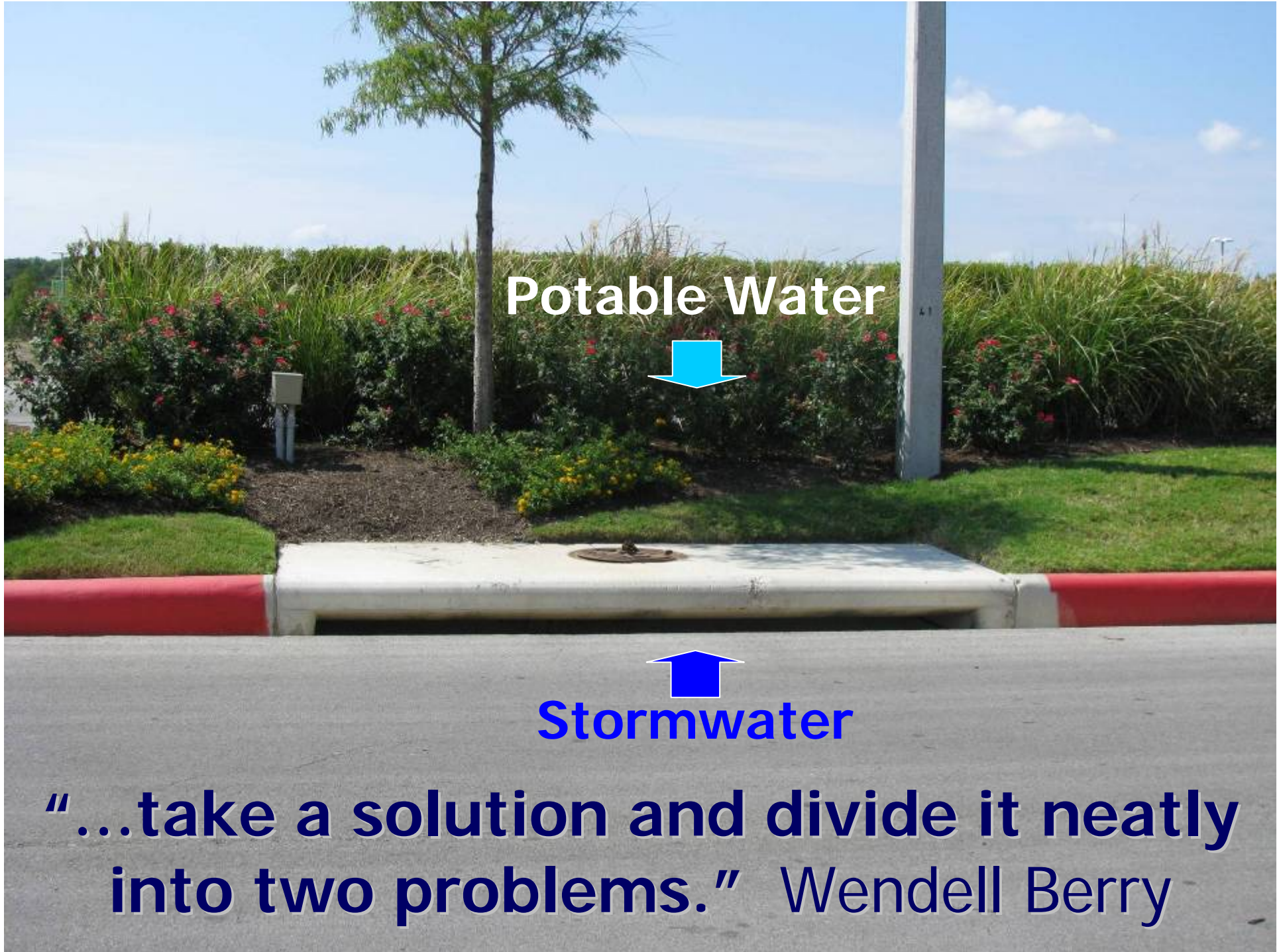




# Innovative Water Management for Commercial Landscaping/ Site Plans



2/1/2012



Potable Water



Stormwater

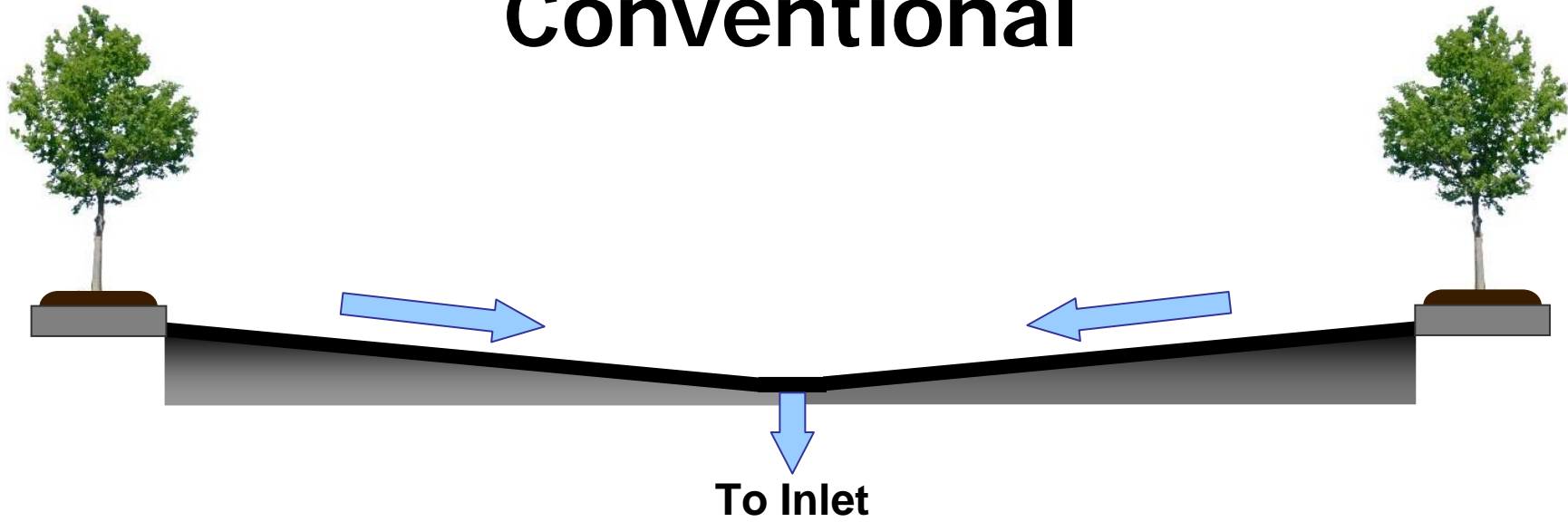


**“...take a solution and divide it neatly into two problems.” Wendell Berry**

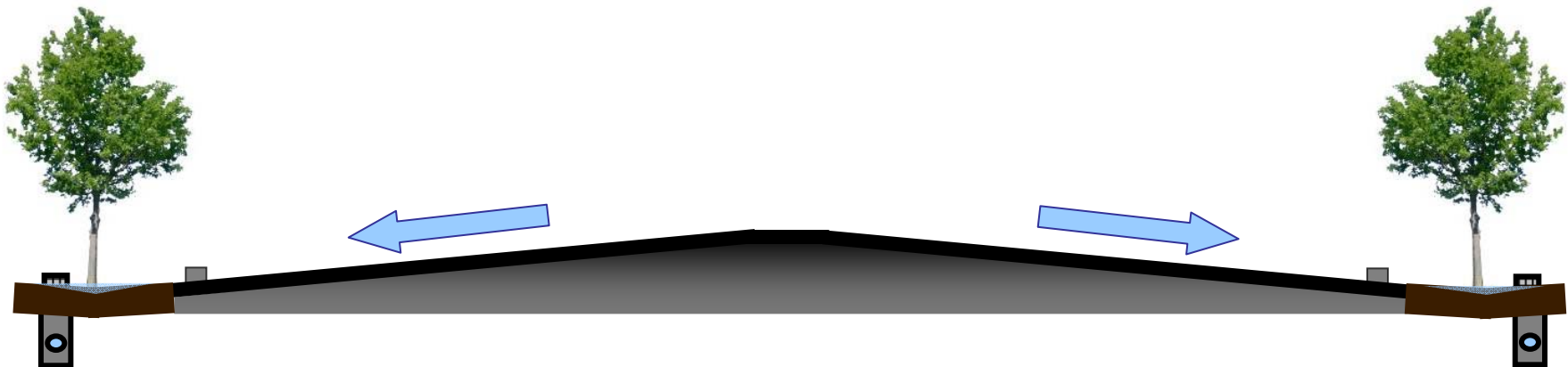
# **Ordinance Goals**

- **Use rainwater wisely**
- **Conserve potable water**
- **Help improve water quality**

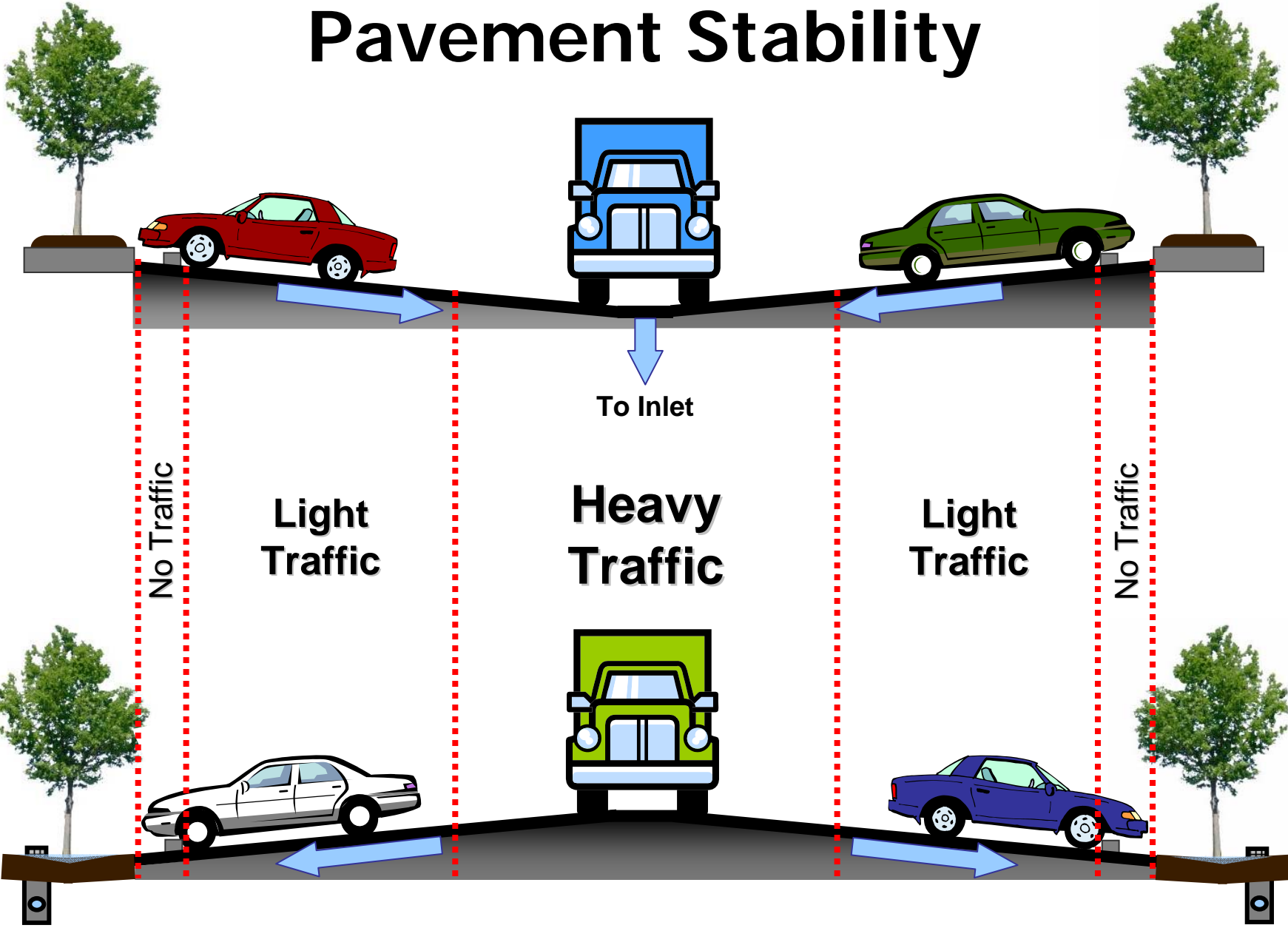
# Conventional



# Potential



# Pavement Stability



# St. Edwards University



# Wal-Mart (Ben White)





**LCRA Redbud Center**





**Avery Ranch**



**Soltiva  
Townhomes**

# Stormwater Requirements

- Direct stormwater runoff to at least **50 percent** of required landscaped area
- Can use non-required landscaping as long as area is equivalent to 50% of required area
- Show drainage areas to landscaping on site plan to demonstrate compliance and sufficient drainage
- Stormwater from “hot spot” land uses (e.g., gas stations) and parking lots over the Recharge Zone may not be used unless landscape doubles as a water quality control

# Constructive Use of Stormwater



**Overland Flow**



**Rainwater Harvesting**



**Rain Garden**



**Disconnected Downspout**

# Undisturbed Vegetation Credit

- Undisturbed natural areas or undisturbed existing trees can count toward the 50 percent requirement
- No potable water irrigation is allowed in order to receive credit



# Supplemental Irrigation

- Irrigation systems (e.g., potable) required for all newly planted trees
- Irrigation systems are required for all other newly planted landscaping, unless certain conditions are met:
  - receiving stormwater runoff
  - drought tolerant plant palette
  - low foot-traffic areas
- Temporary irrigation required for two growing seasons if no permanent irrigation is provided

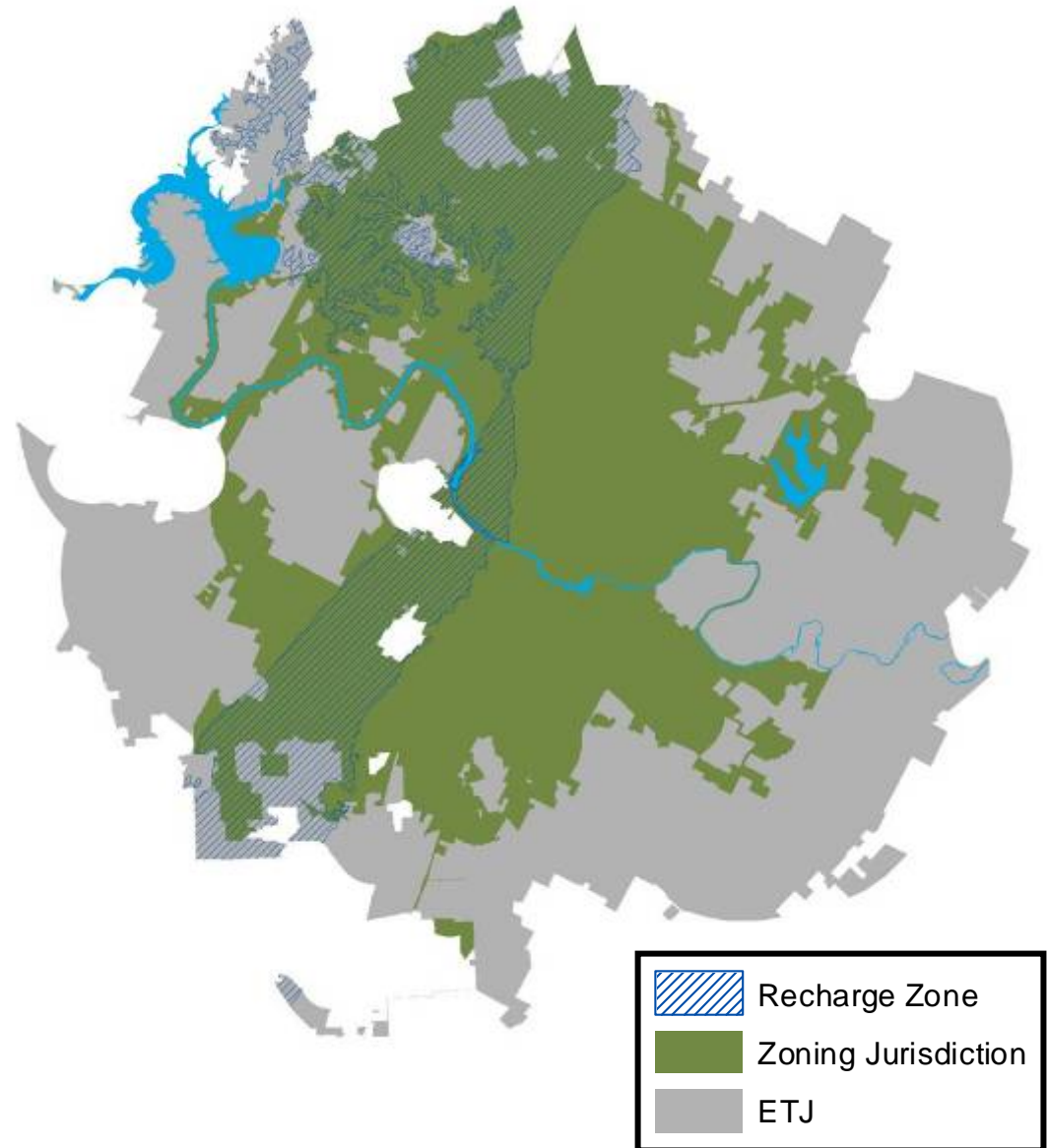


# Ordinance Flexibility

- Administrative variance allowed for unique site conditions, such as topography, size, shape, and location of existing features
- Staff will report to City Council two years after adoption about the effectiveness of the ordinance, including recommendations for improvements or amendments

# Ordinance Applicability

- City's zoning jurisdiction only
- Development projects requiring a site plan
  - some exceptions e.g., central business district





# Summary

- Conserve potable water and improve water quality by using rainwater wisely and preserving existing vegetation.
- Unique site challenges are addressed with flexible menu of options to achieve compliance.
- Other major US cities have successfully implemented similar requirements.
- Begin a new generation of sustainable sites now.

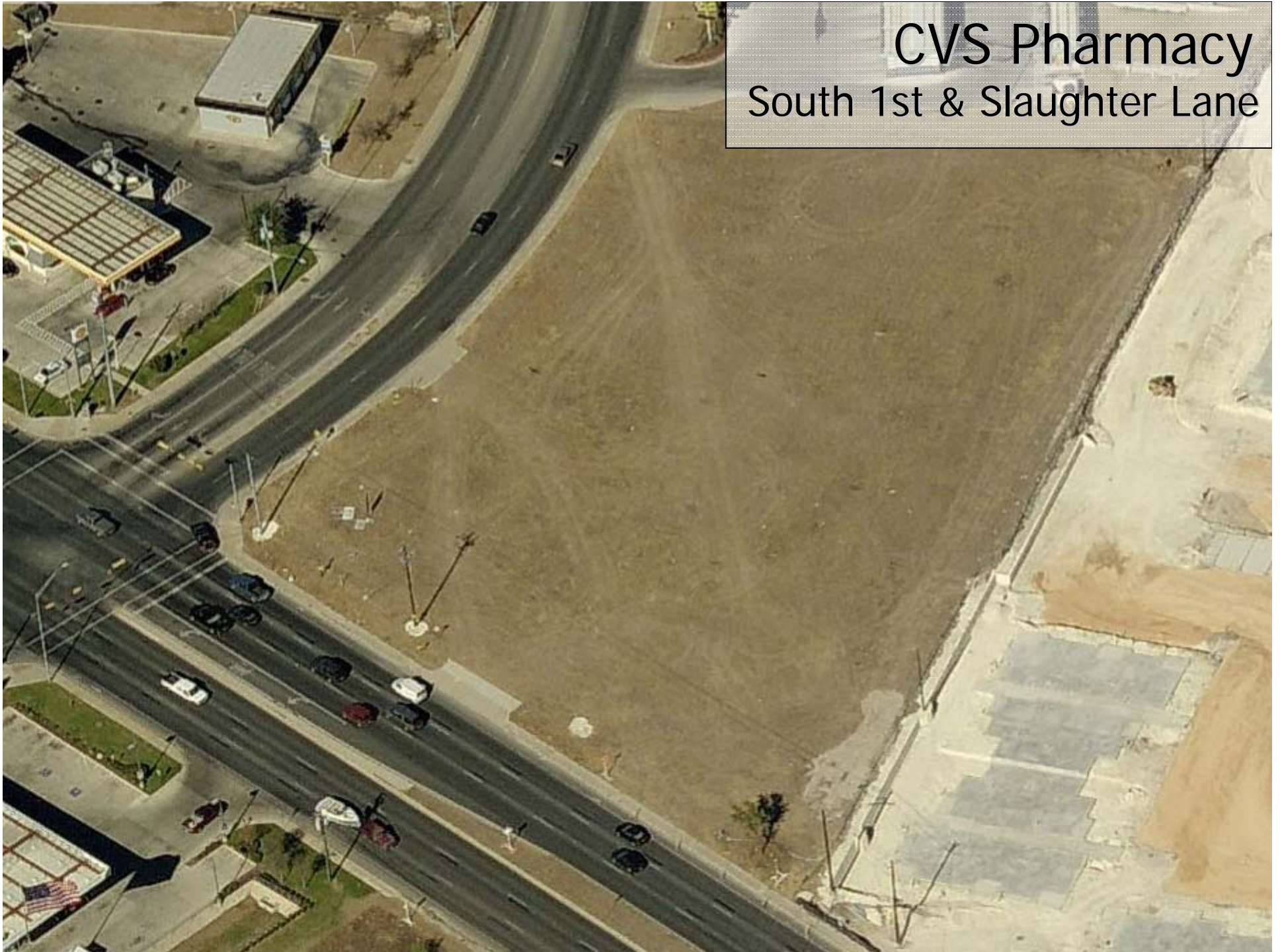
# Case Studies



# CVS Pharmacy South 1st & Slaughter Lane



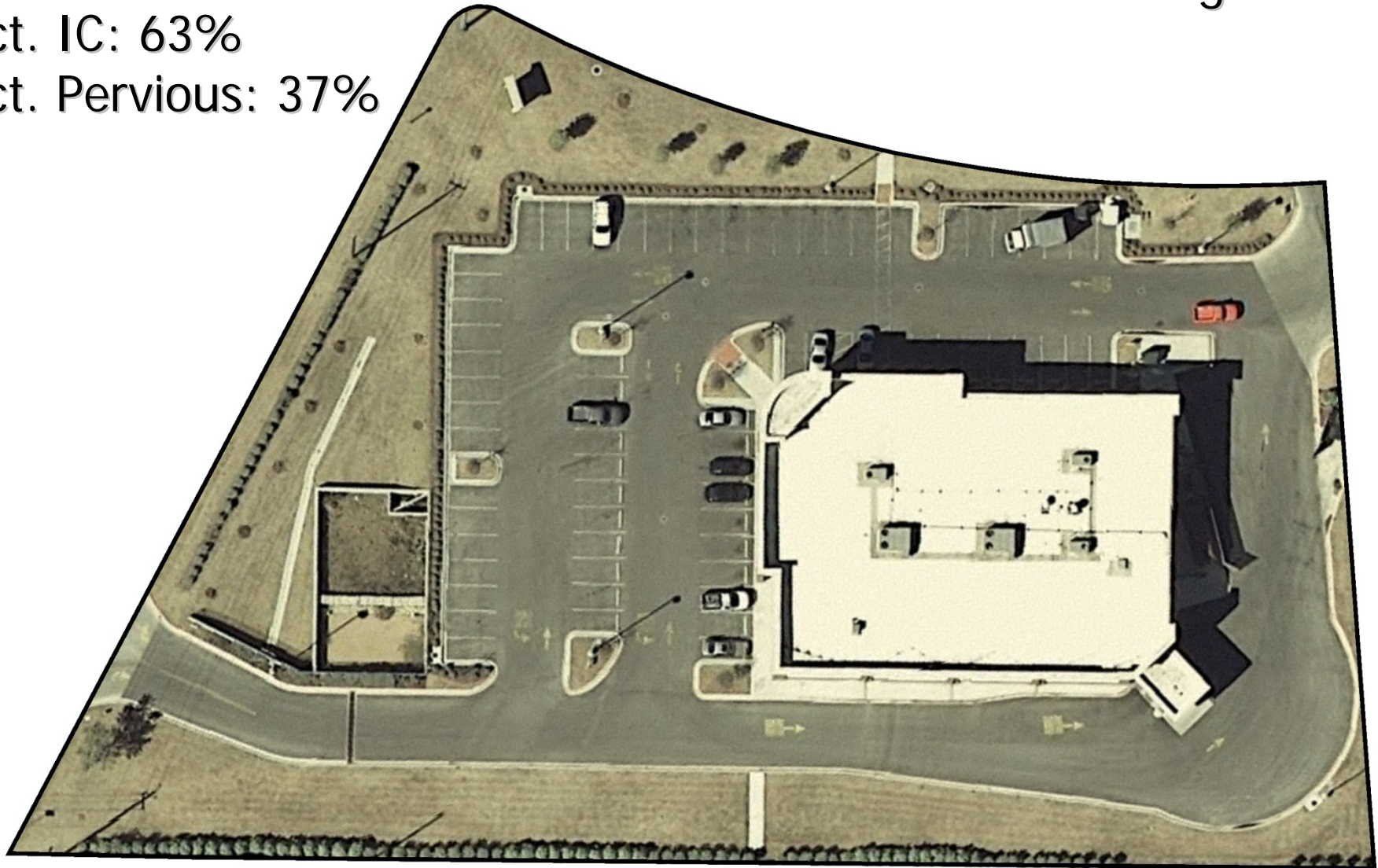
CVS Pharmacy  
South 1st & Slaughter Lane



Total Site: 2.4 acres  
Pervious: 0.9 acres  
Pct. IC: 63%  
Pct. Pervious: 37%

# CVS Pharmacy

South 1st & Slaughter Lane









**CVS**  
pharmacy

ENTER DIABETES  
SERVICES  
SIGN UP NOW

CVS Pharmacy

1st





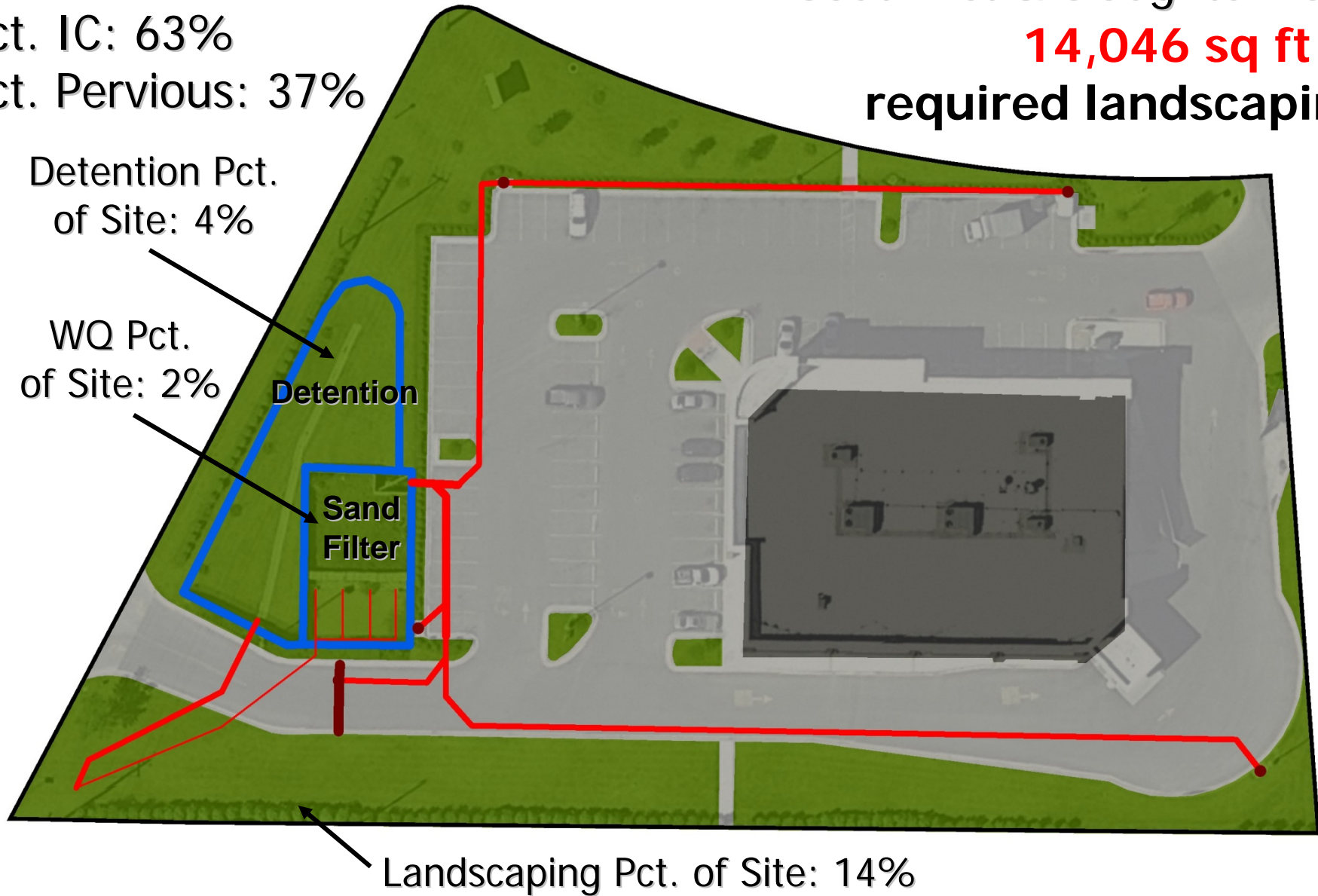


Total Site: 2.4 acres  
Pervious: 0.9 acres  
Pct. IC: 63%  
Pct. Pervious: 37%

# CVS Pharmacy

South 1st & Slaughter Lane

**14,046 sq ft** of  
required landscaping

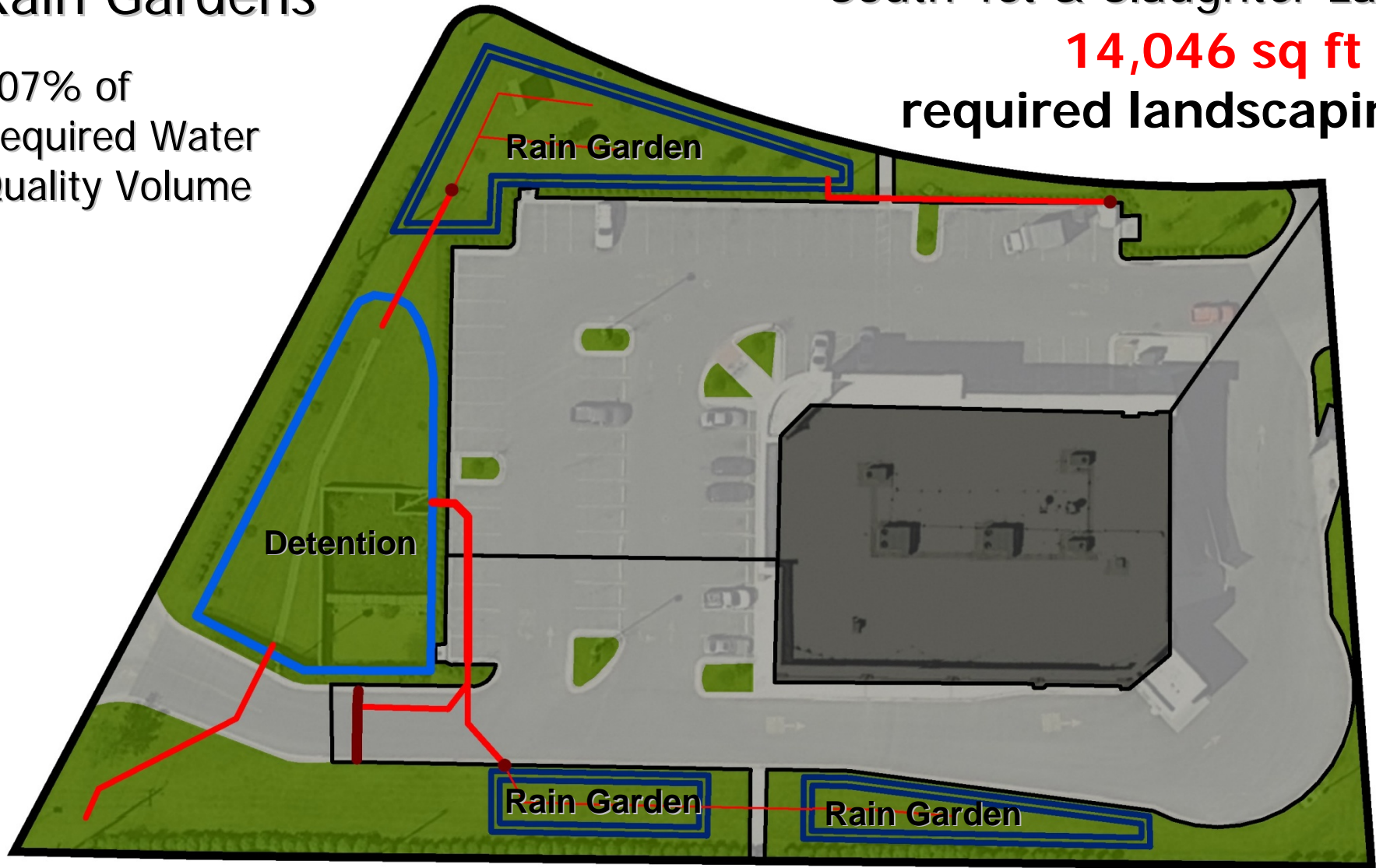


# Potential for Rain Gardens

107% of Required Water Quality Volume

CVS Pharmacy  
South 1st & Slaughter Lane

**14,046 sq ft** of required landscaping



# CVS Site: Conventional Sand-Filter vs. Rain Garden Cost Analysis

Cost Component	\$/Units	Rain Garden	Existing/ Conventional
<b>Water Quality Control</b>			
Excavation	\$15/yd3	\$ 5,863	5,823
Embankment	\$5/yd3	\$ 358	\$ -
Concrete	\$500/yd3	\$ -	\$ 34,861
Rain Garden Soil	\$36/yd3	\$ 8,062	\$ -
Sand	\$8/yd3	\$ -	\$ 421
6" perforated pipe	\$23/ft	\$ 4,674	\$ 2,185
6" solid pipe	\$20/ft	\$ 1,701	\$ 1,900
<b>Subtotal Water Quality Control</b>		<b>\$ 20,658</b>	<b>\$ 45,190</b>
<b>Storm Drainage</b>			
18" RCP	\$90.30/ft	\$ 30,702	\$ 72,782
<b>Landscaping (Water Quality areas only)</b>			
Required Plants			
\$/Plant	\$16/each	\$ 9,744	\$ 2,100 *
Sod cost	\$3.60/yd2	\$ 1,719	\$ 859 *
<b>Subtotal Landscaping</b>		<b>\$ 11,463</b>	<b>\$ 2,959</b>
<b>Totals</b>		<b>\$ 62,823</b>	<b>\$ 120,931</b>

\* Pro-rated costs for landscaping in areas in common with rain garden



8 feet

**Three Points  
Retail Center**

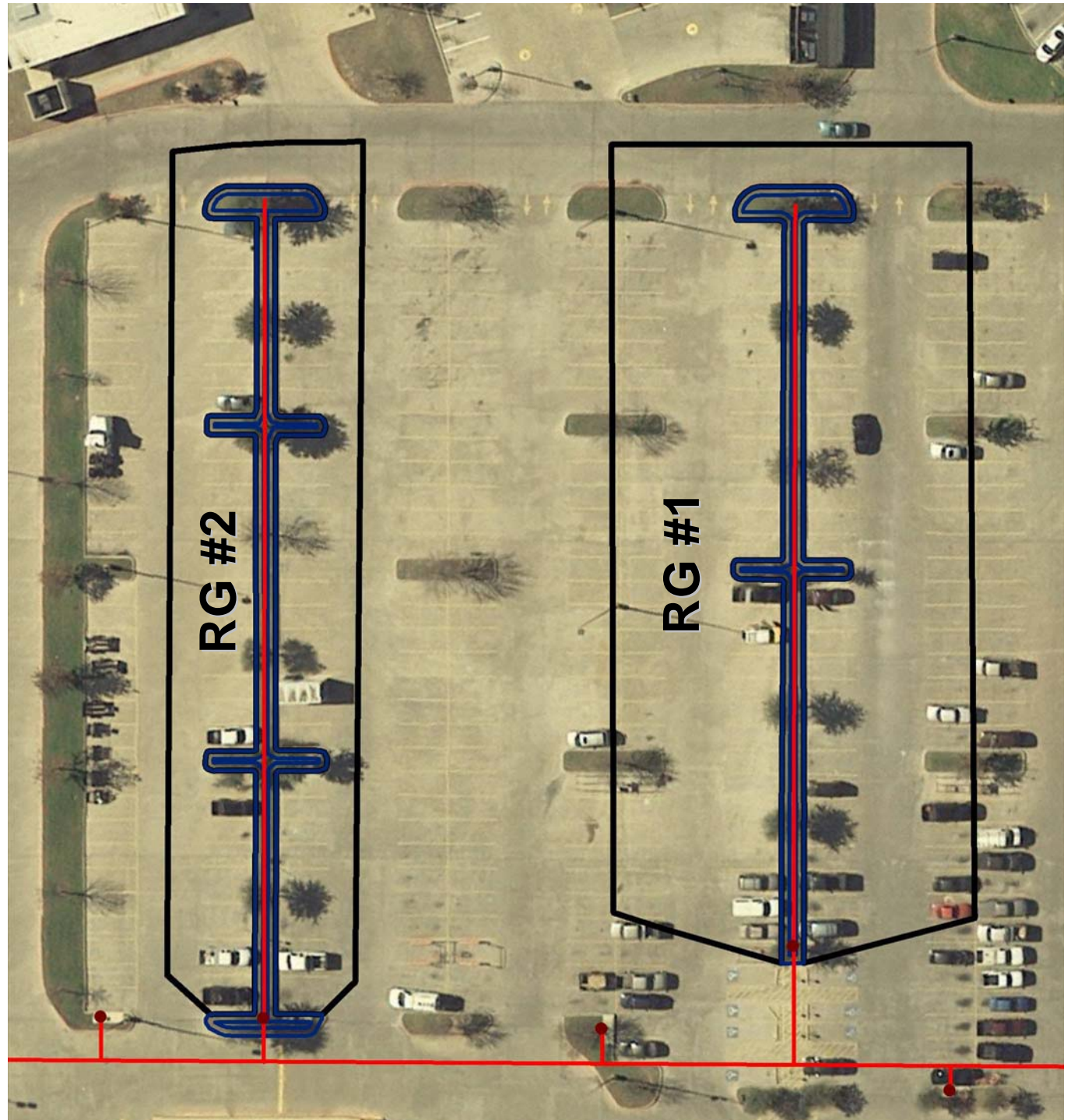
Code now requires  
10-foot medians

## Rain Garden #1

- **10:1** Ratio of Impervious Cover to Drainage Area
- **88%** Imp. Cover
- **62%** of Required Water Quality Volume

## Rain Garden #2

- **5:1** Ratio of Impervious Cover to Drainage Area
- **82%** Imp. Cover
- **134%** of Required Water Quality Volume



# Barton Creek Cinema

Walsh Tarlton & Loop 360











# Other Major US Jurisdictions

- Tucson
- Portland
- Seattle
- Philadelphia
- Minneapolis
- Los Angeles
- San Diego
- New York City
- State of Maryland
- State of Wisconsin

