



SAN ANTONIO  
RIVER AUTHORITY

# Rolling Oaks Area Regional Center Watershed & Land Use Study

08.08.2022



**Committed to Safe, Clean, Enjoyable Creeks and Rivers.**

# Problem

Adding buildings, parking, and roads without stormwater mitigation to Rolling Oaks area will pollute rivers and increase flooding.

# Opportunity

There are tools available to meet development needs, lessen pollution and flooding, and improve community health.



# Goal

- Use multi-benefit site planning and development tools to lessen pollution and flooding.
- Educate and connect stakeholders with resources
- Inform land use and policy decisions
- Inform infrastructure investments



# Urban Stormwater

40% evapotranspiration

10% runoff

25% shallow infiltration

25% deep infiltration

30% evapotranspiration

55% runoff

10% shallow infiltration

5% deep infiltration





# Pollution

- Trash
- Bacteria
- Sediment
- Nutrients
- Metals
- Hydrocarbons

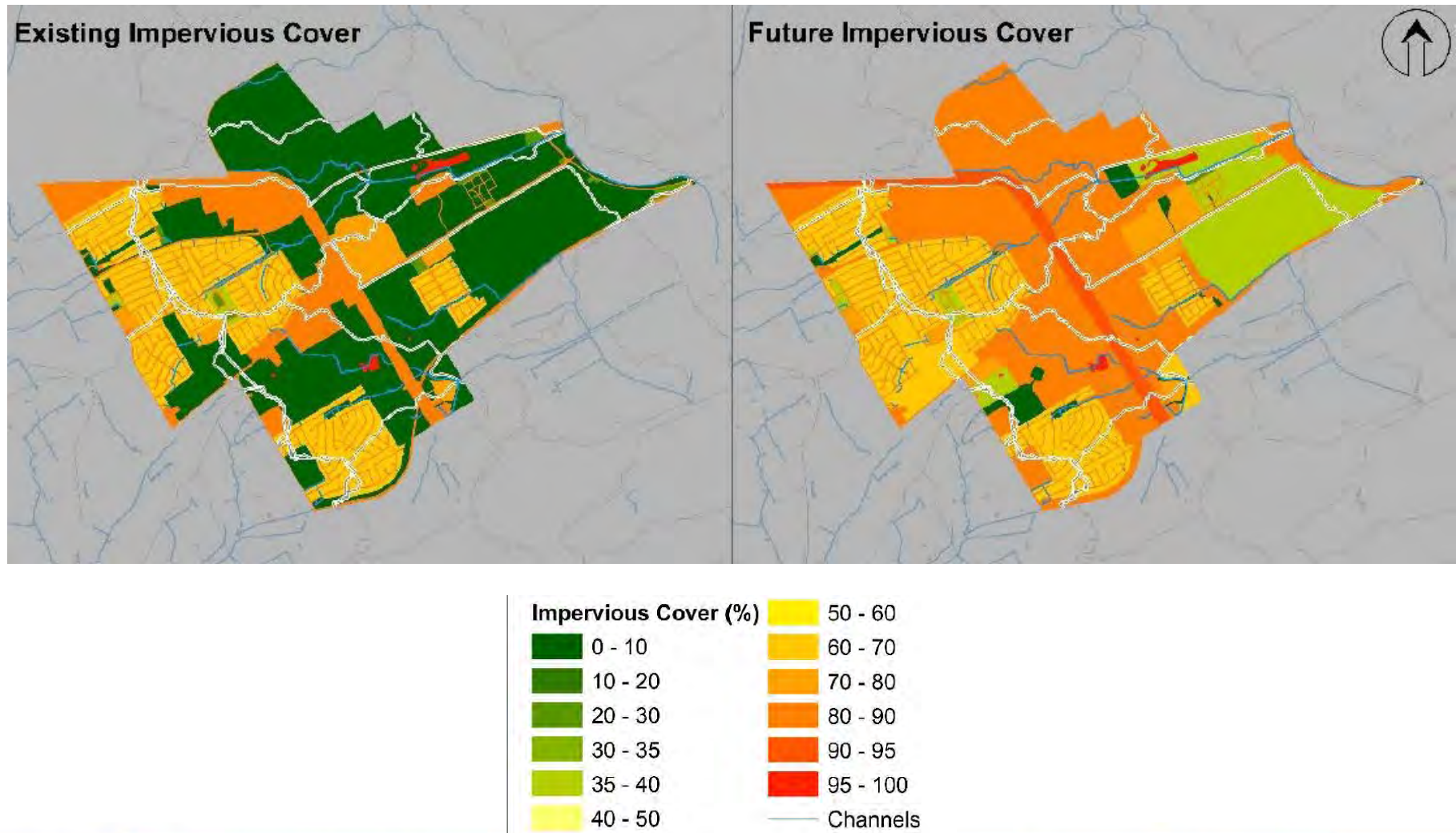


# Flood Risk

- Human life and safety
- Infrastructure and property



# Rolling Oaks Impervious Change



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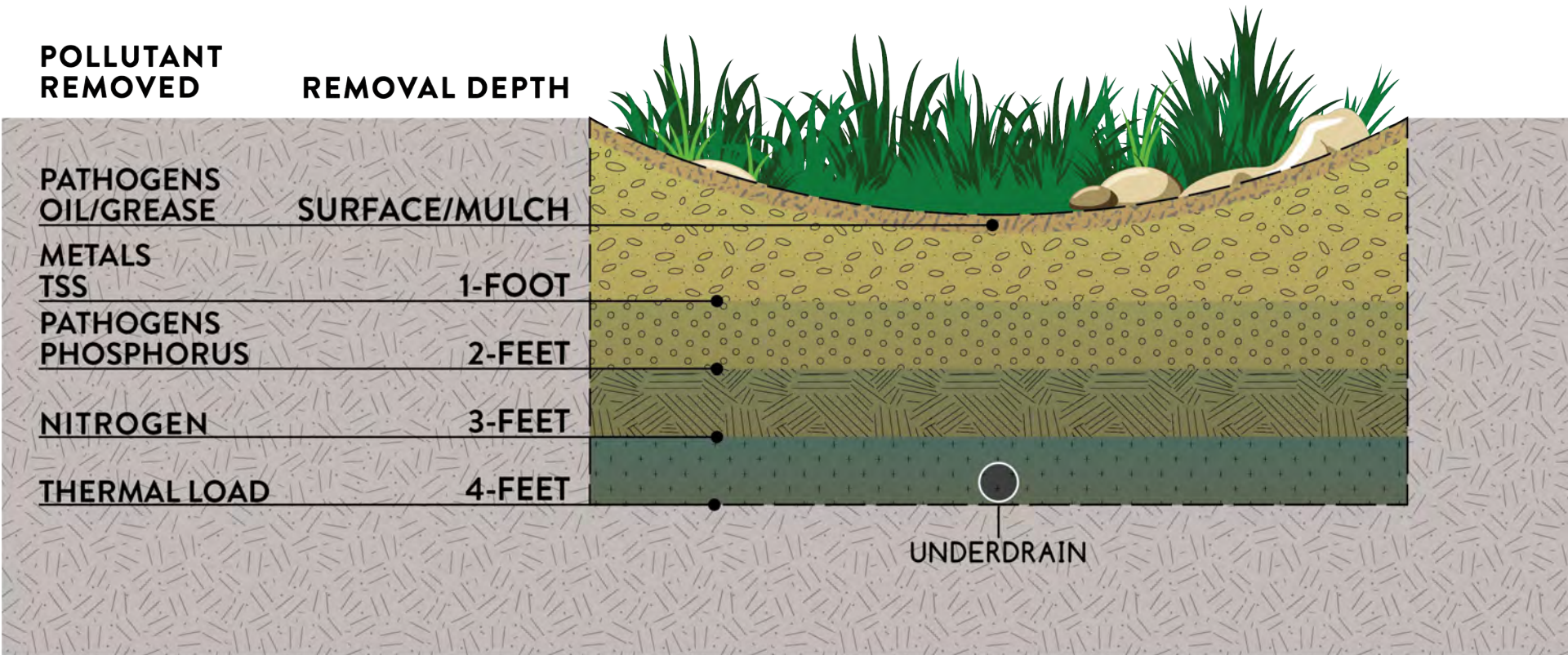
# Green Infrastructure

## Bioswale

- Imitates natural water flows
- Uses soils, vegetation, and earthworks
- Slows, spreads and soaks in rainwater where it falls
- Treats rainwater as a resource
- Complements traditional “gray” infrastructure (curbs, gutters, drains, pipes)

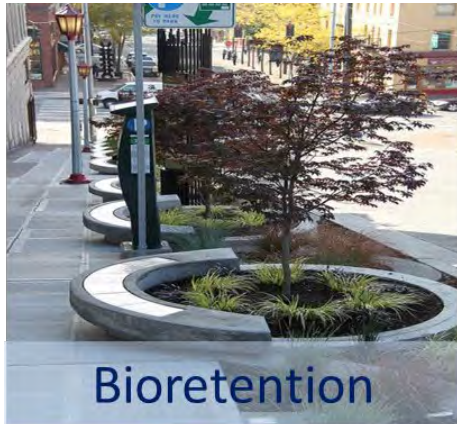


# Green Infrastructure





# Green Infrastructure



Bioretention

Photo: SVR Design Company



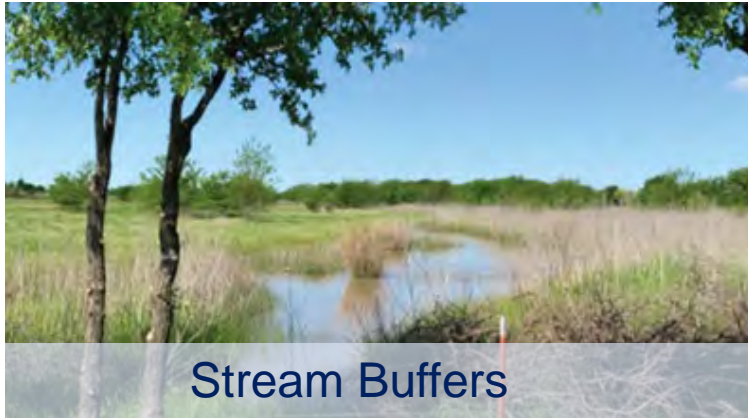
Green Roof

Photo: San Antonio Express News



Planter Box

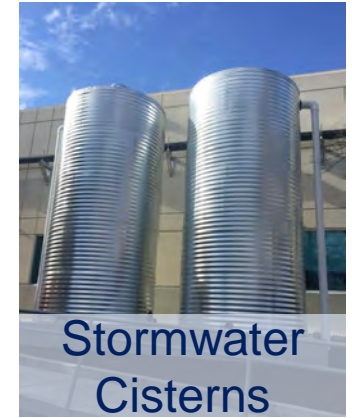
Photo: <http://media-cache-ec0.pinimg.com>



Stream Buffers



Bioswale

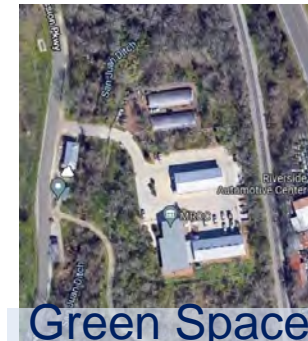


Stormwater Cisterns

<https://www.chescoplanning.org/MuniCorner/Tools/26-ClusterDev.cfm>



Cluster or Conservation Development



Green Space Preservation



# Multi-Benefits

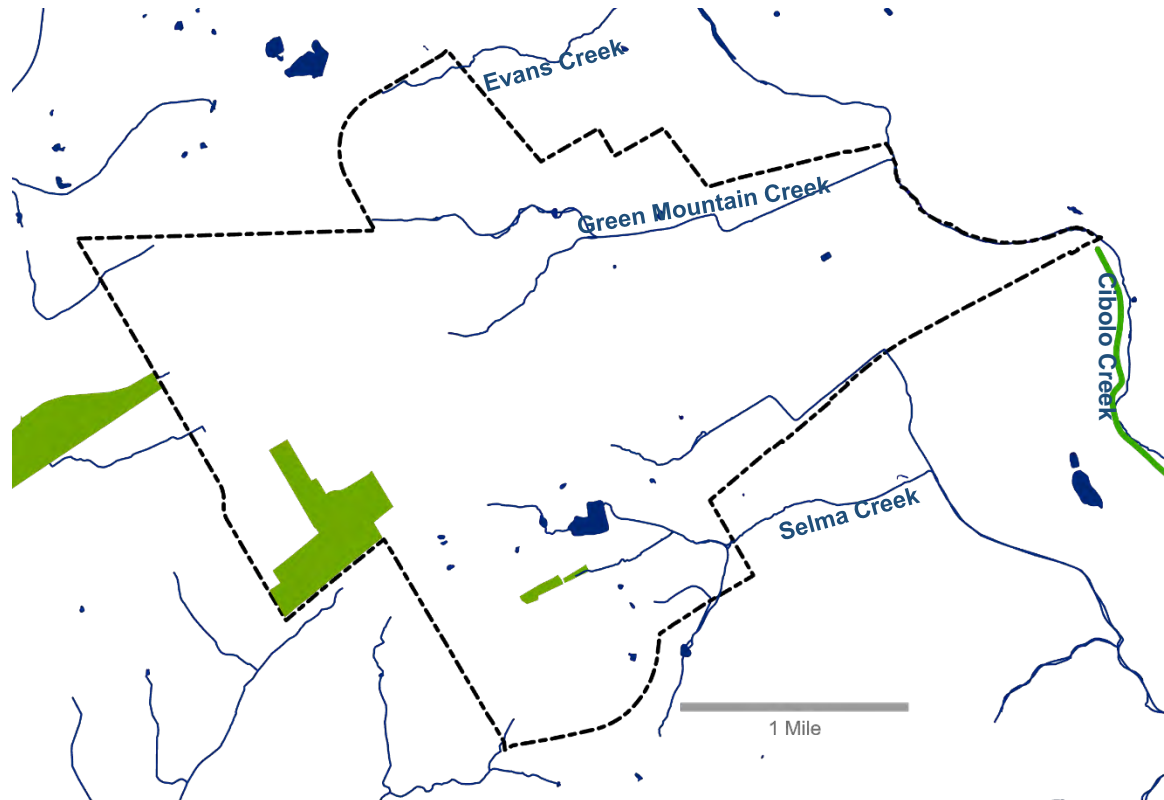
- Stream and stormwater quality
- Flood reduction
- Trash reduction
- Habitat Improvement
- Recreation
- Air pollution reduction
- Urban heat reduction





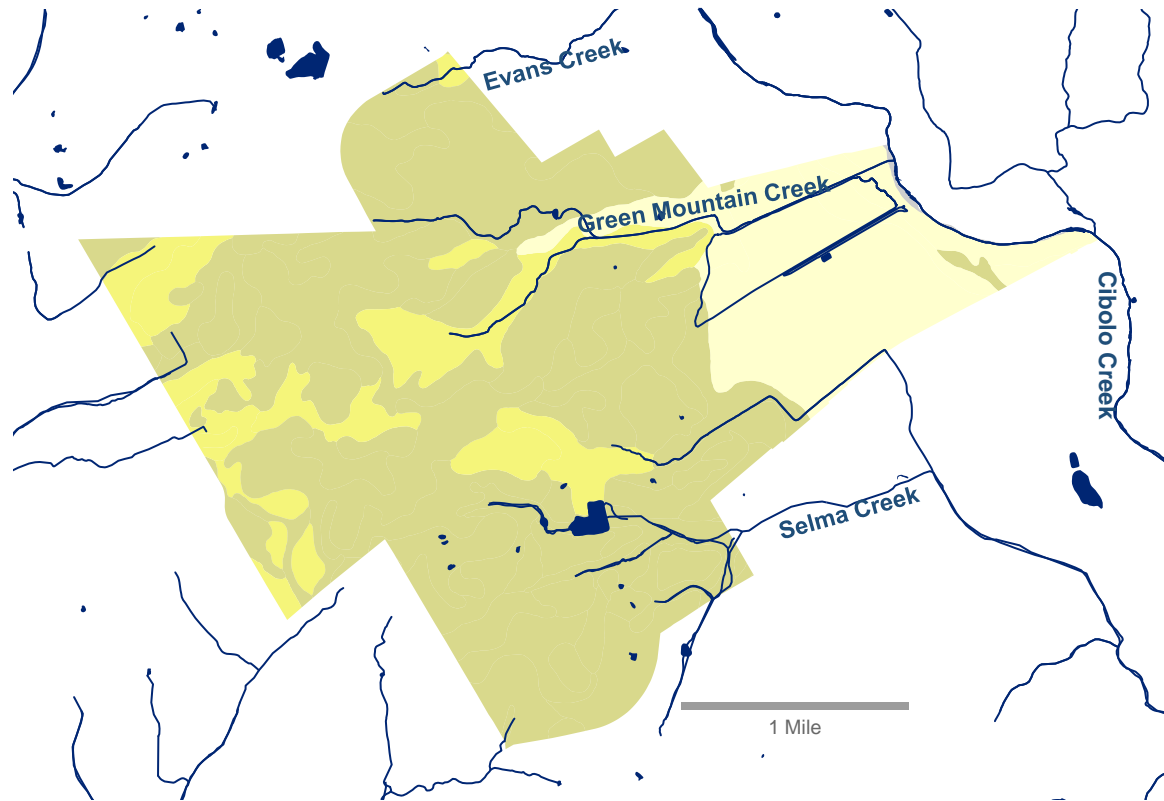
# Inventory

- Streams
- Parks & Trails



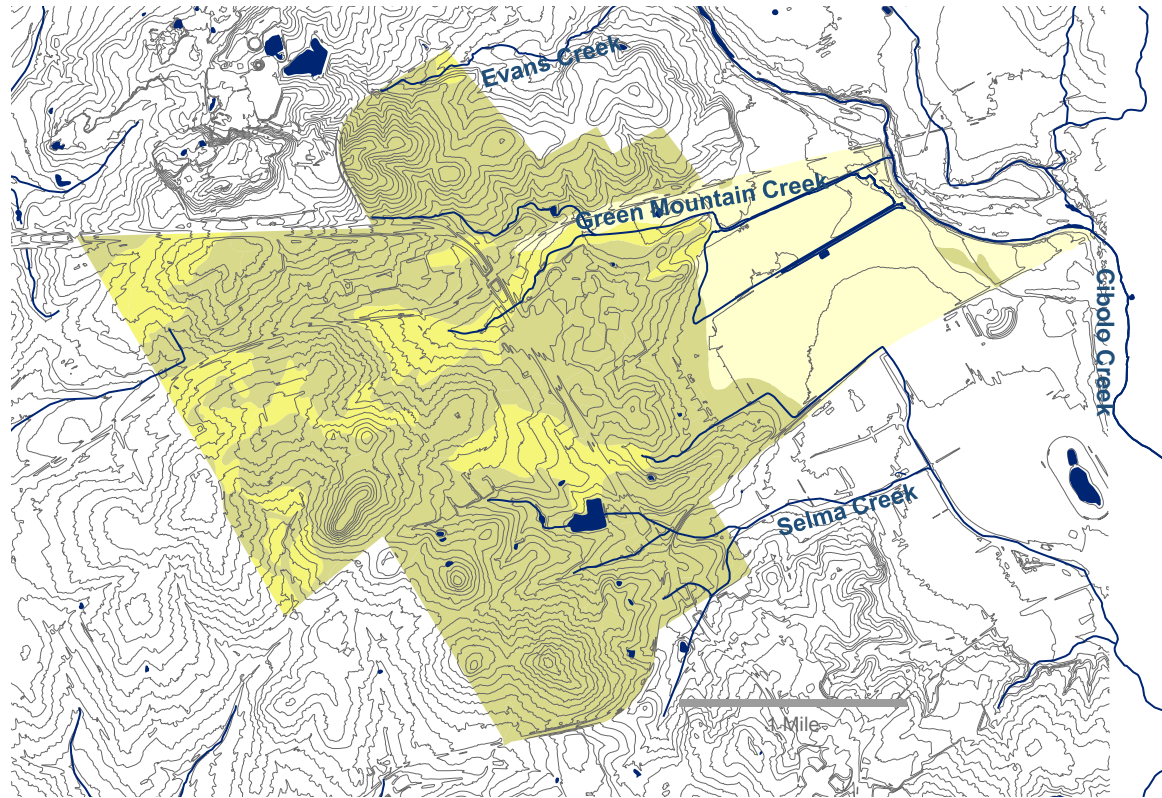
# Inventory

- Streams
- Parks & Trails
- Soils
  - Best Infiltration
  - Moderate Infiltration
  - Poor Infiltration



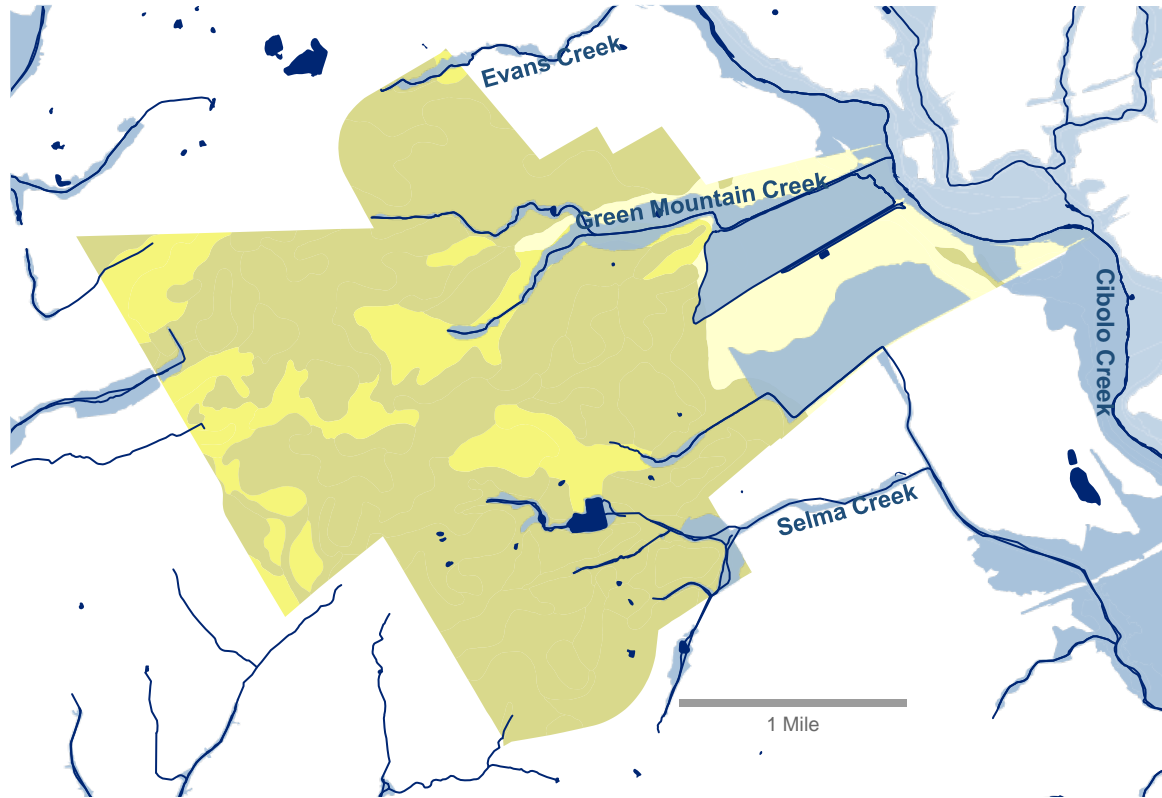
# Inventory

- Streams
- Parks & Trails
- Soils
- Topography



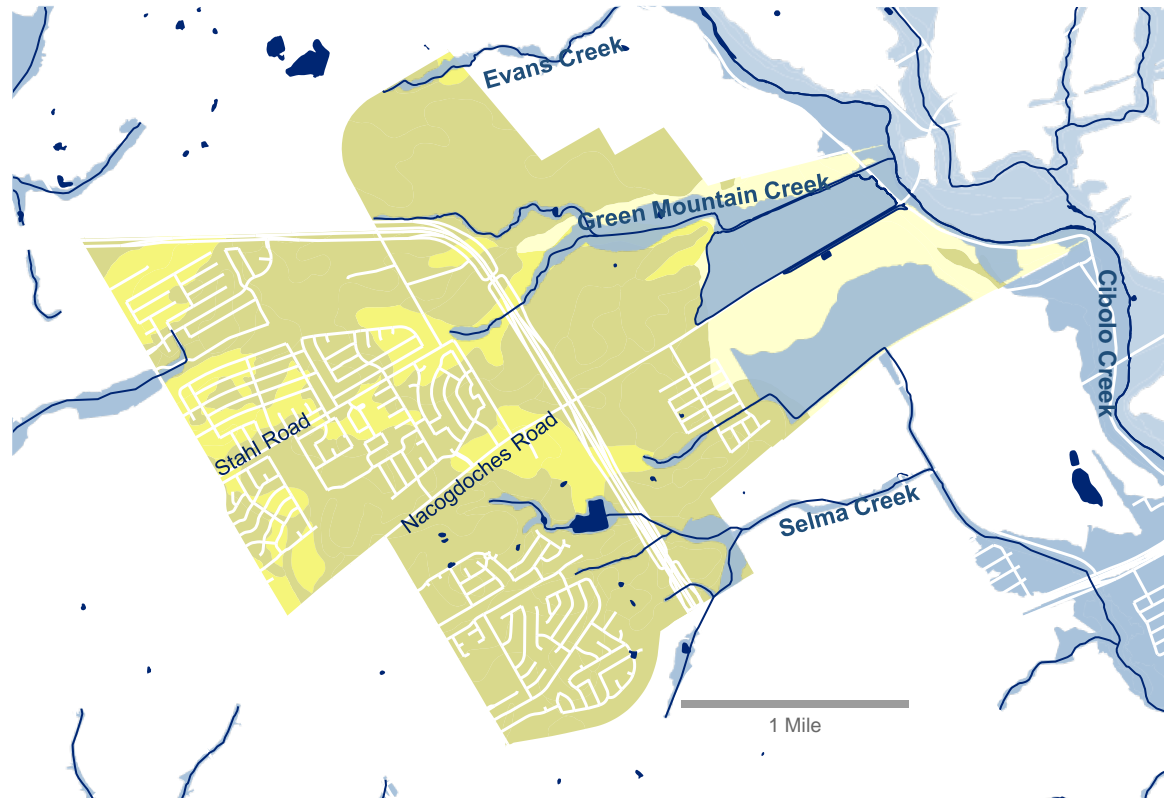
# Inventory

- Streams
- Parks & Trails
- Soils
- Topography
- Floodplains



# Inventory

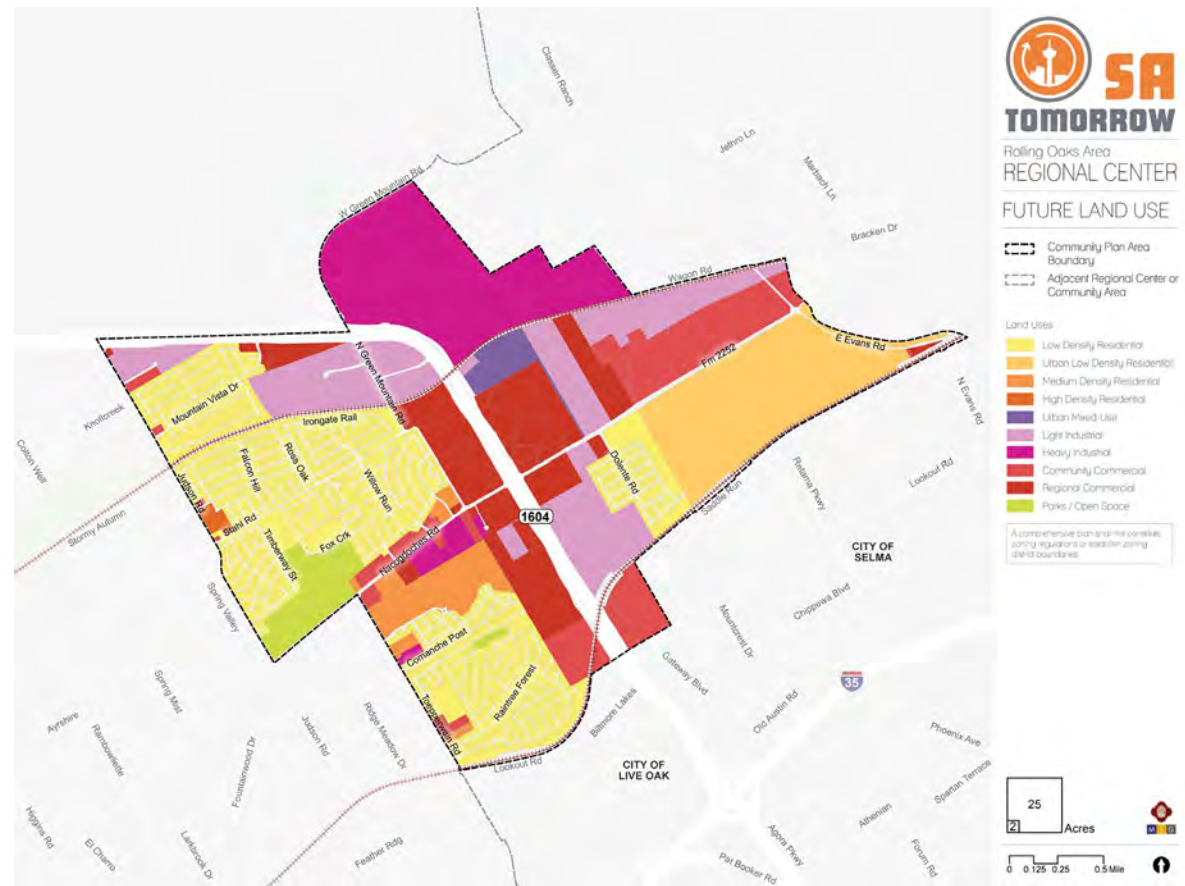
- Streams
- Parks & Trails
- Soils
- Topography
- Floodplains
- Roads





# Inventory

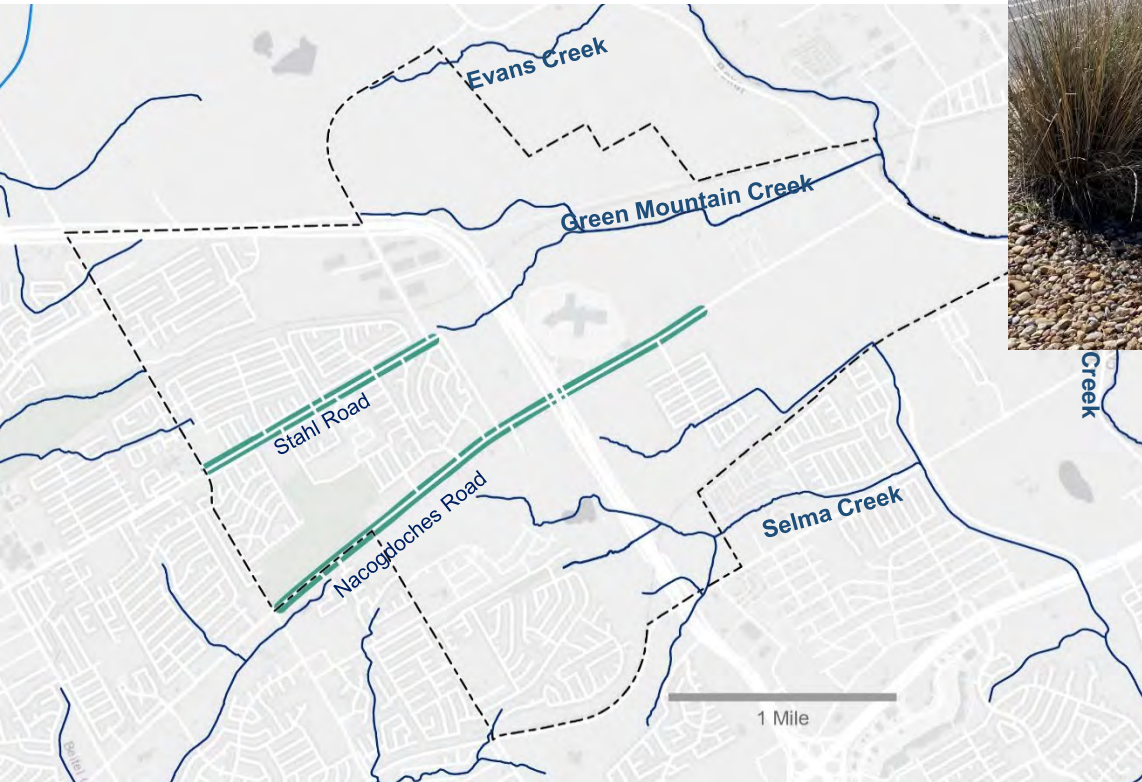
- Streams
- Parks & Trails
- Soils
- Topography
- Floodplains
- Roads
- Future land use





# Recommendations

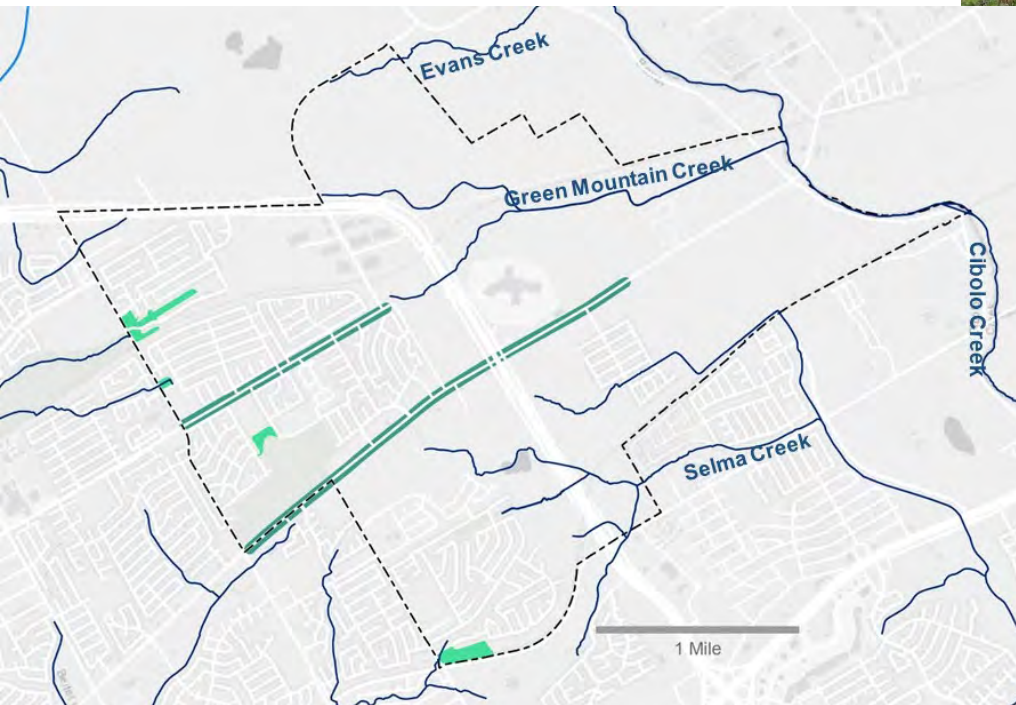
- **Green Streets**





# Recommendations

- Green Streets
- **Stormwater Parks**





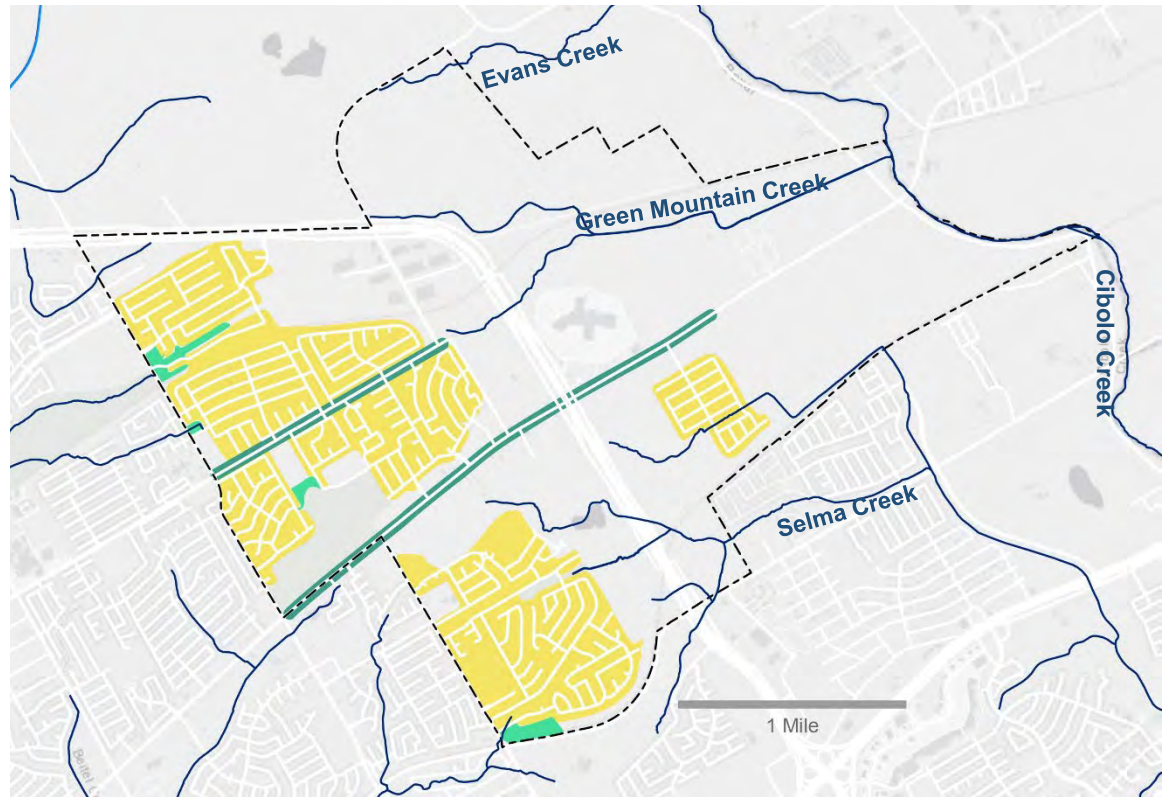
# Recommendations





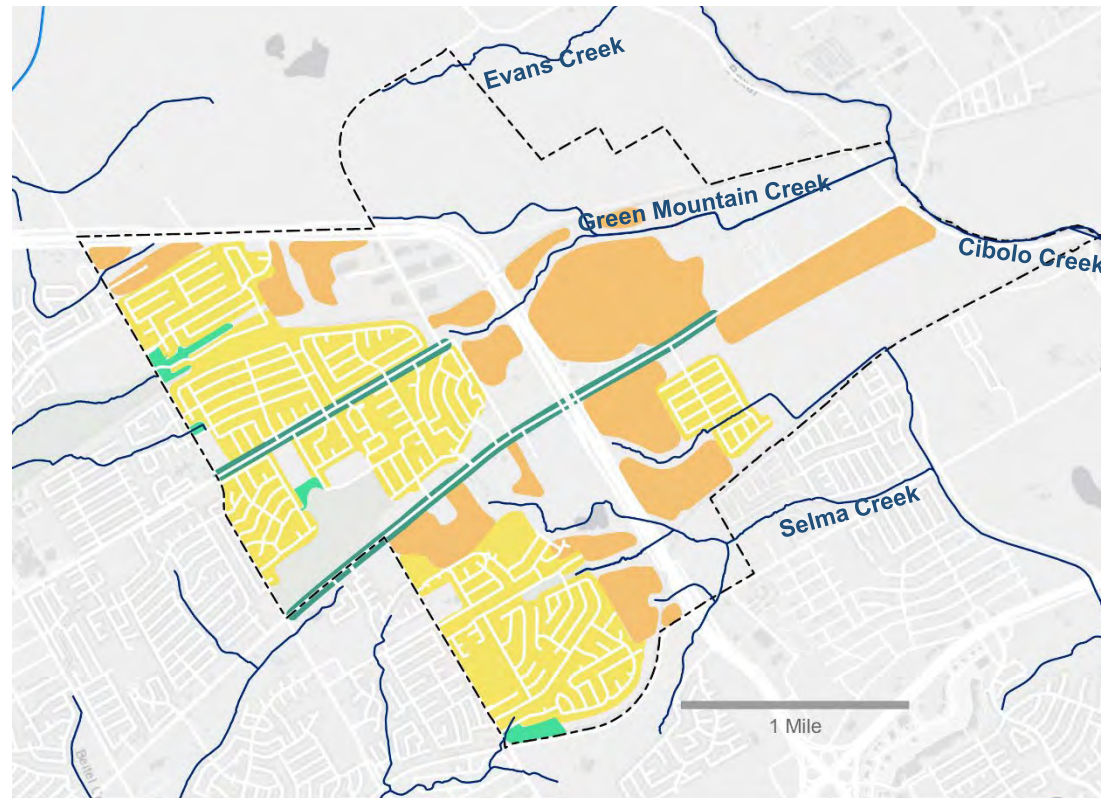
# Recommendations

- Green Streets
- Stormwater Parks
- **Home Retrofits**



# Recommendations

- Green Streets
- Stormwater Parks
- Home Retrofits
- **New Development**





# Recommendations

- Green Streets
- Stormwater Parks
- Home Retrofits
- New Development
- **Stream Buffers**



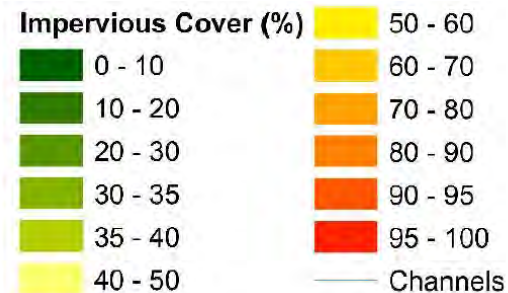
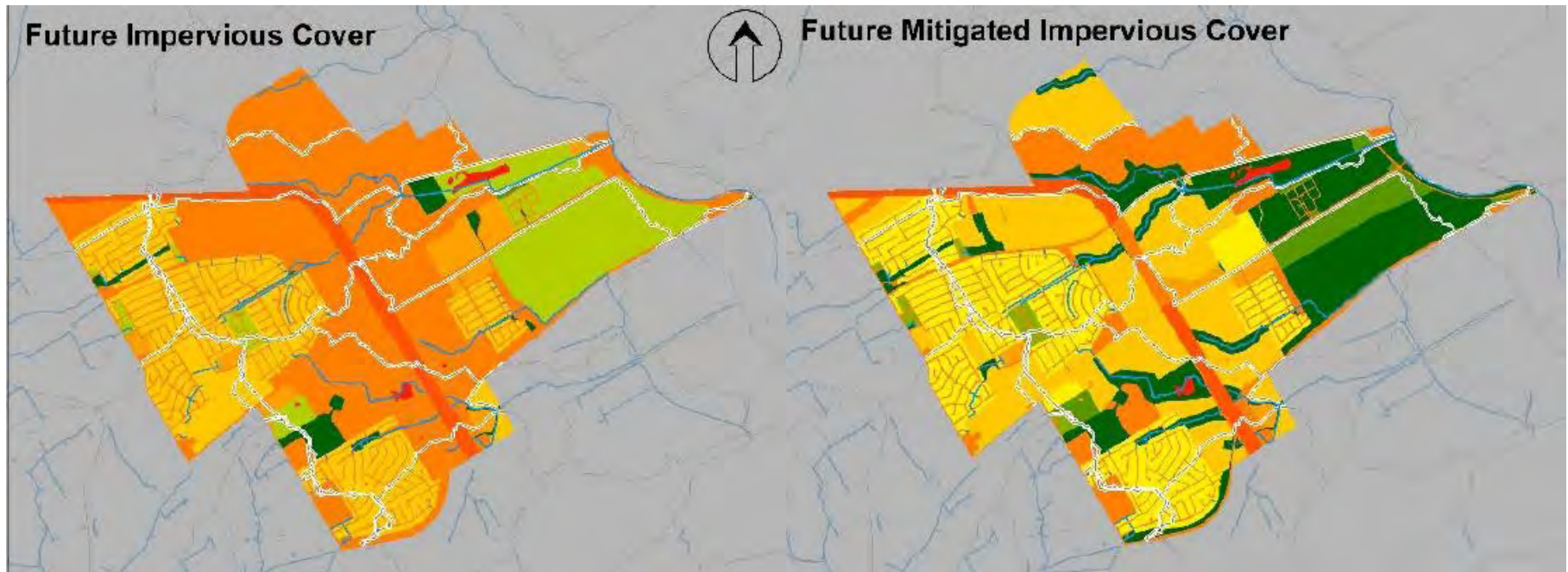


# Recommendations

- Green Streets
- Stormwater Parks
- Home Retrofits
- New Development
- Stream Buffers
- **Street Sweep & Pet Waste Programs**

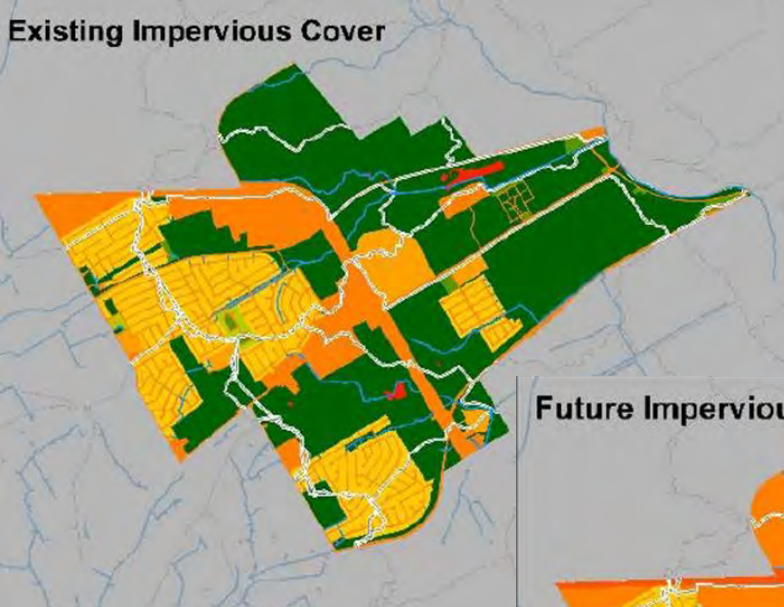


# Results

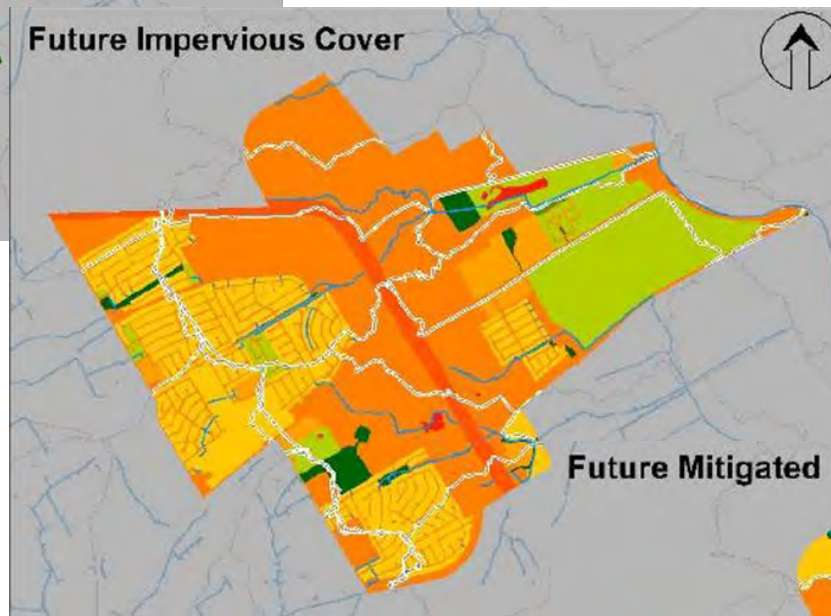




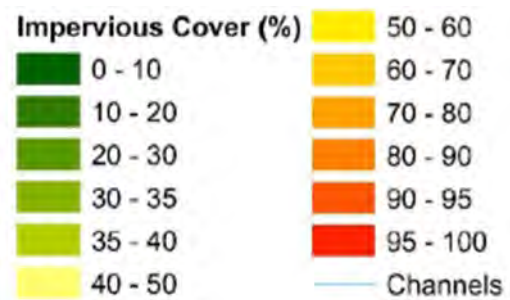
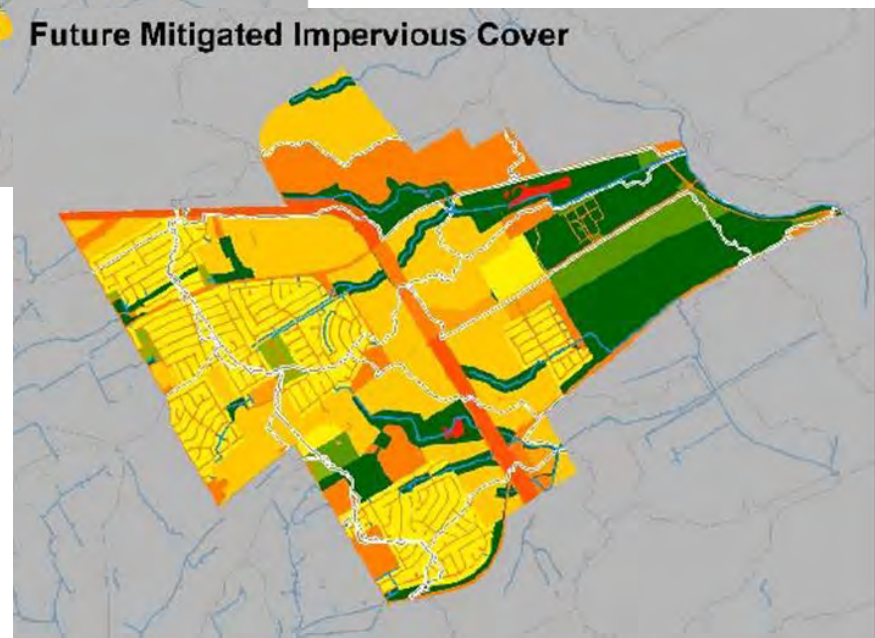
Existing Impervious Cover



Future Impervious Cover



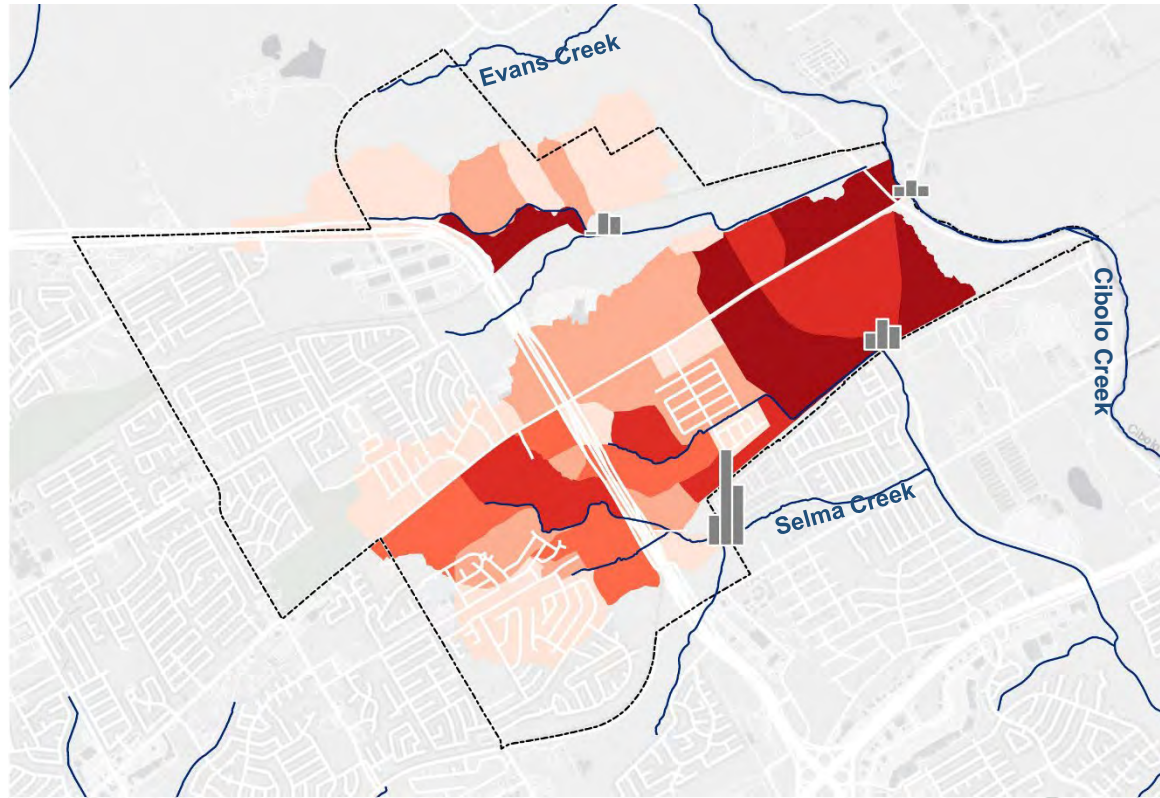
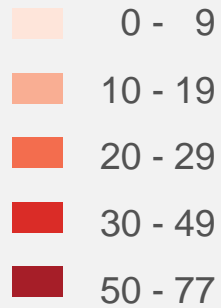
Future Mitigated Impervious Cover



# Results

## 2 Year Rain Events

% Flow Reduction

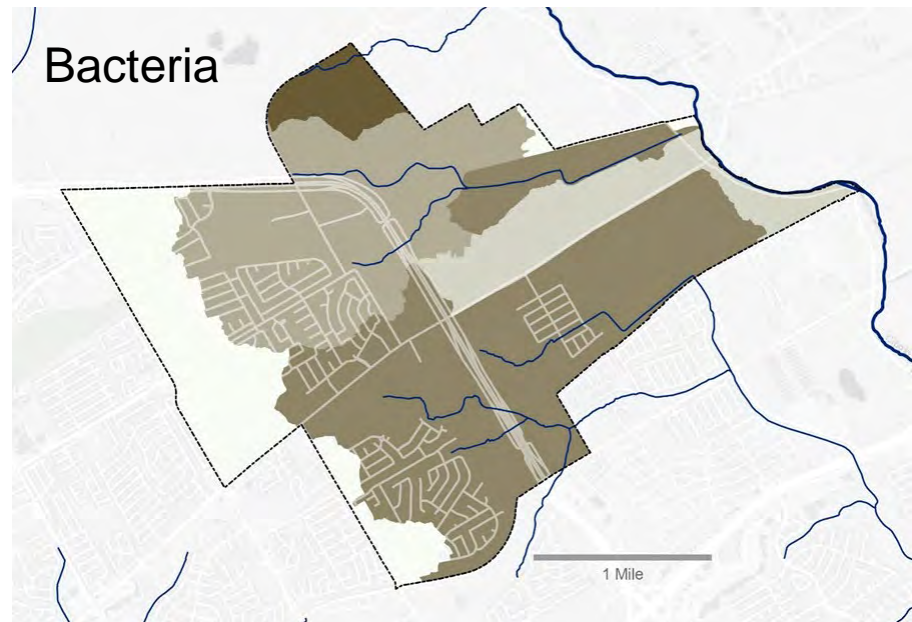
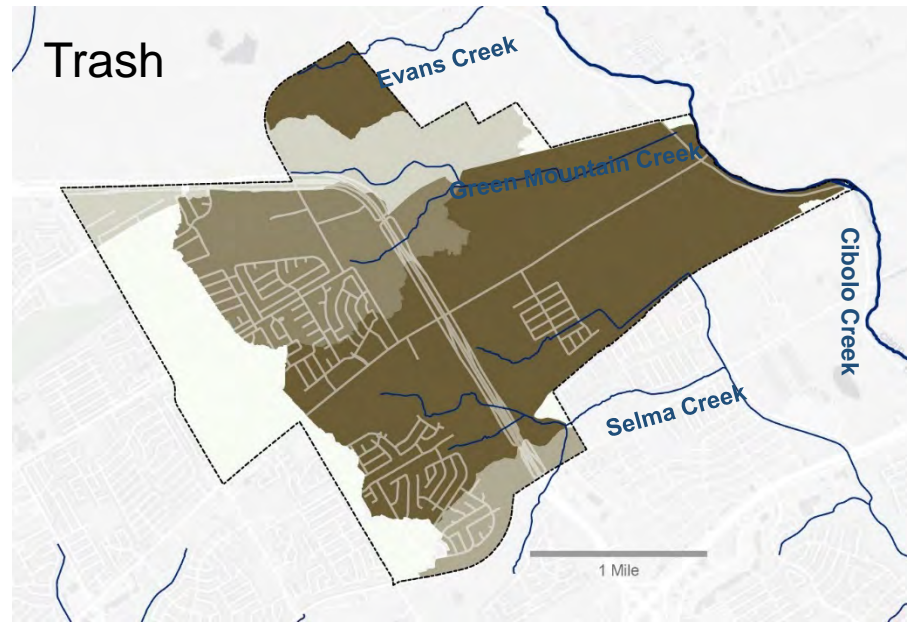
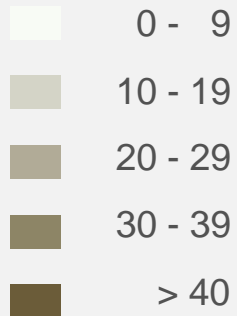




# Results

## Trash and Bacteria

Annual % reduction



# Study Conclusions

Restoring and protecting streams and floodplains, combined with other green infrastructure listed below, reduces water pollution and flooding:

- Green Streets
- Stormwater Parks
- Home Retrofits
- Stream Buffers
- Street Sweep & Pet Waste Programs

Green infrastructure provides multiple community benefits:

- Stream and stormwater quality
- Flood reduction
- Trash reduction
- Habitat improvement
- Urban heat island reduction
- Recreation
- Air pollution





# A quick look ahead

