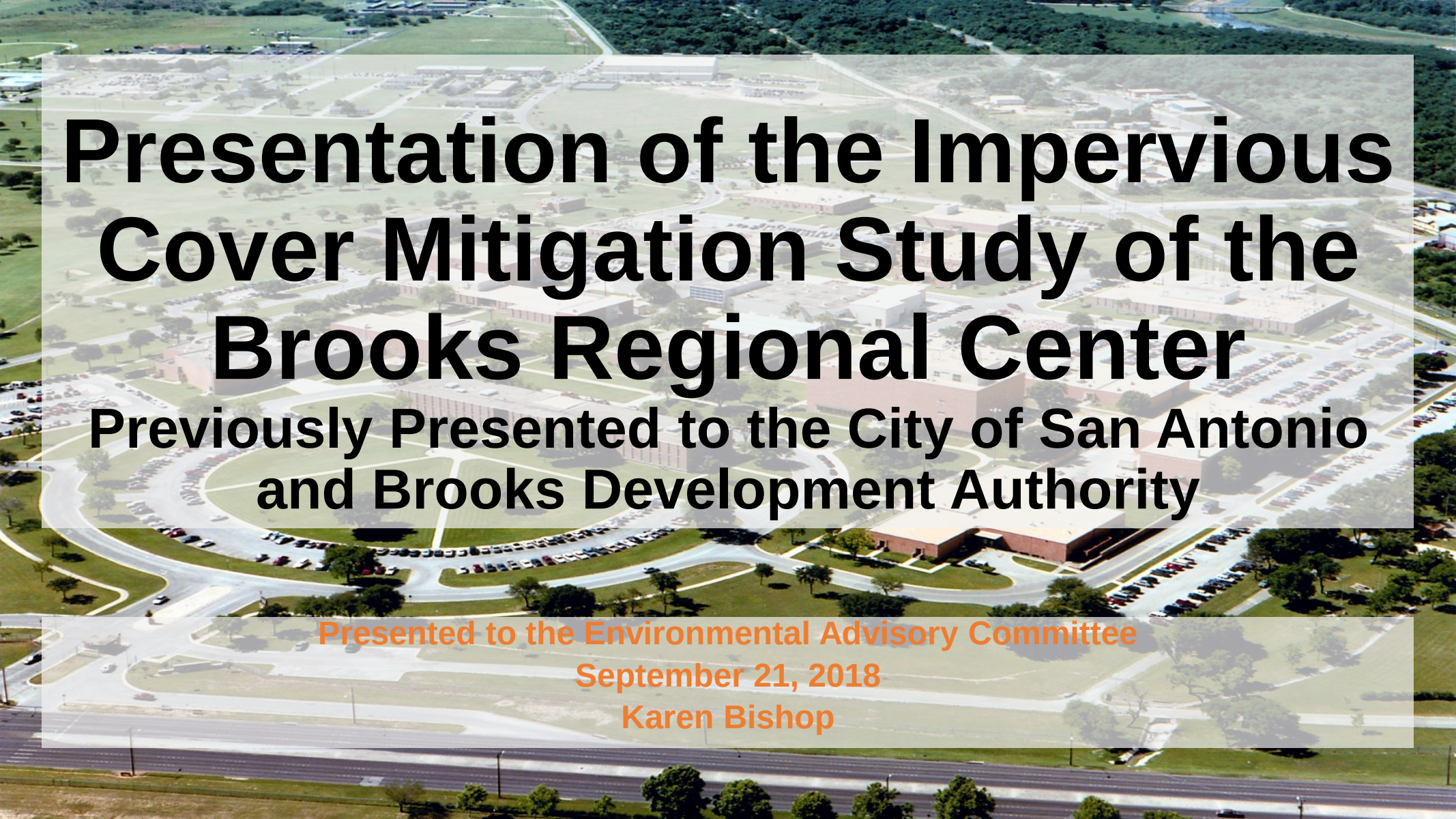


Presentation of the Impervious Cover Mitigation Study of the Brooks Regional Center

Previously Presented to the City of San Antonio and Brooks Development Authority

Presented to the Environmental Advisory Committee

September 21, 2018

Karen Bishop

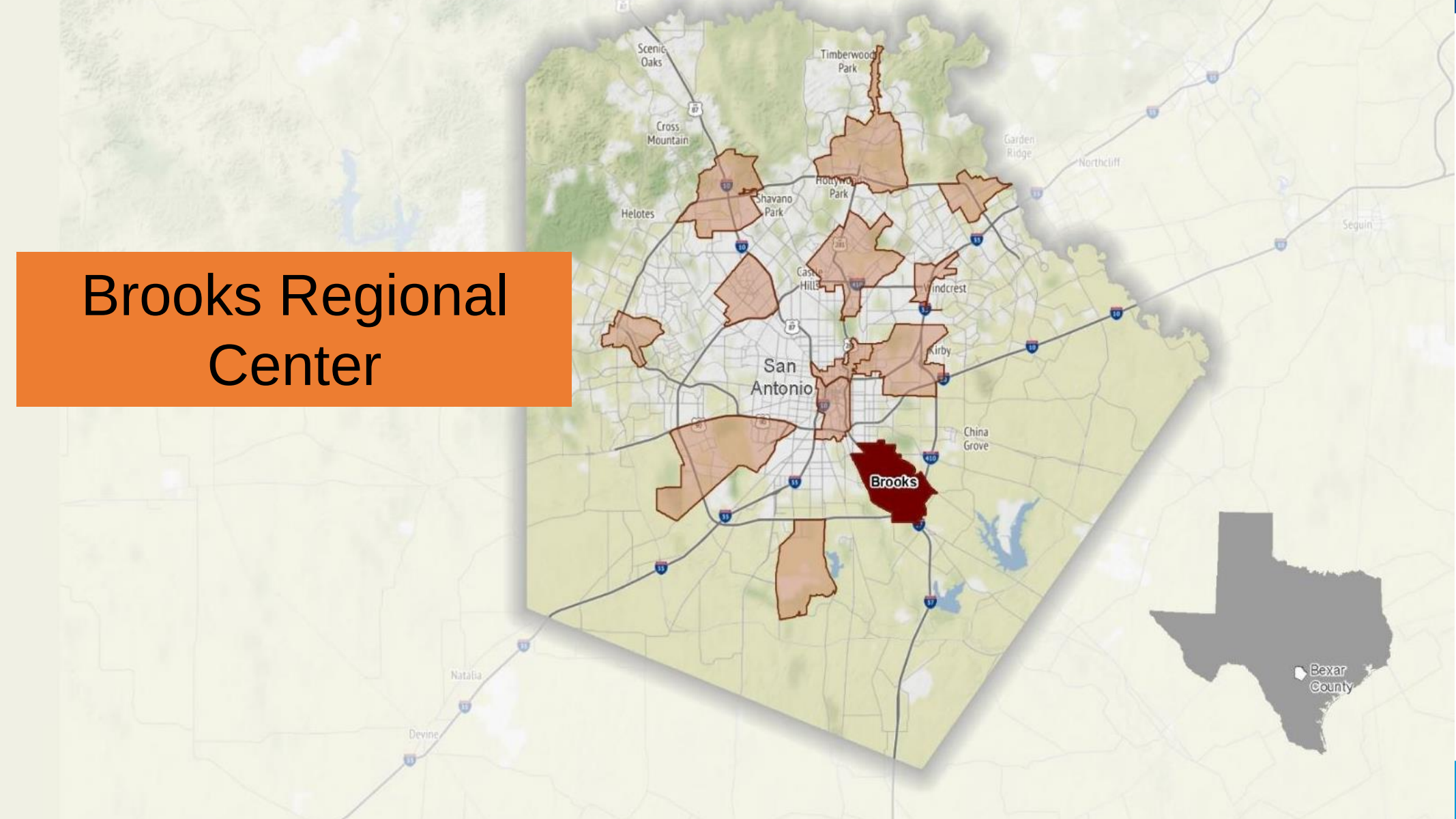
City of San Antonio
SA Tomorrow Plan

Comprehensive Plan

Sustainability Plan

Multimodal Transportation Plan

Brooks Regional Center



Brooks Regional Center

The Brooks area of San Antonio has a rich history.

From 1917 to the early 2000s, Brooks served as a national military center for aviation and aeronautics.

Today, Brooks has a mission and vision to be a catalyst for economic development and to enhance opportunities for those who live, work, learn and play there.

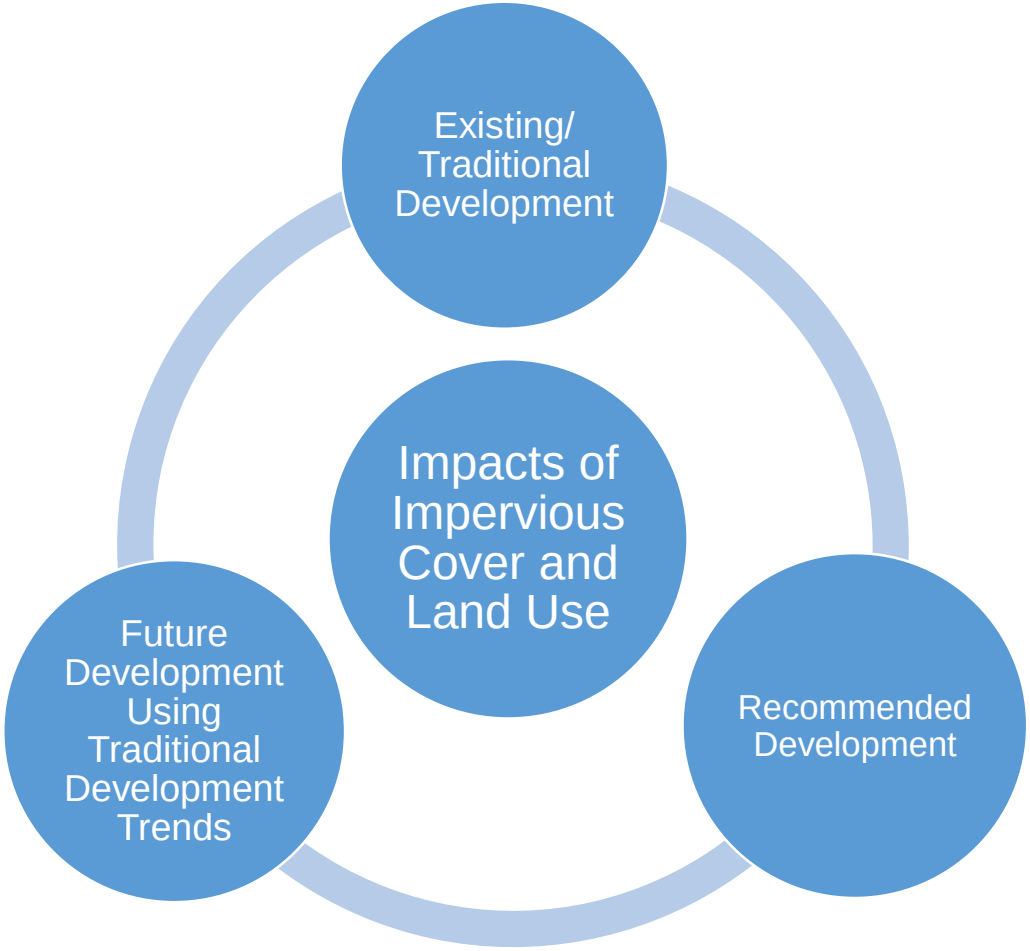
Ideal Study Area

Brooks is an ideal Regional Center to study from a **watershed perspective.**

It has a **diversity of land uses** and existing **undeveloped** open space.

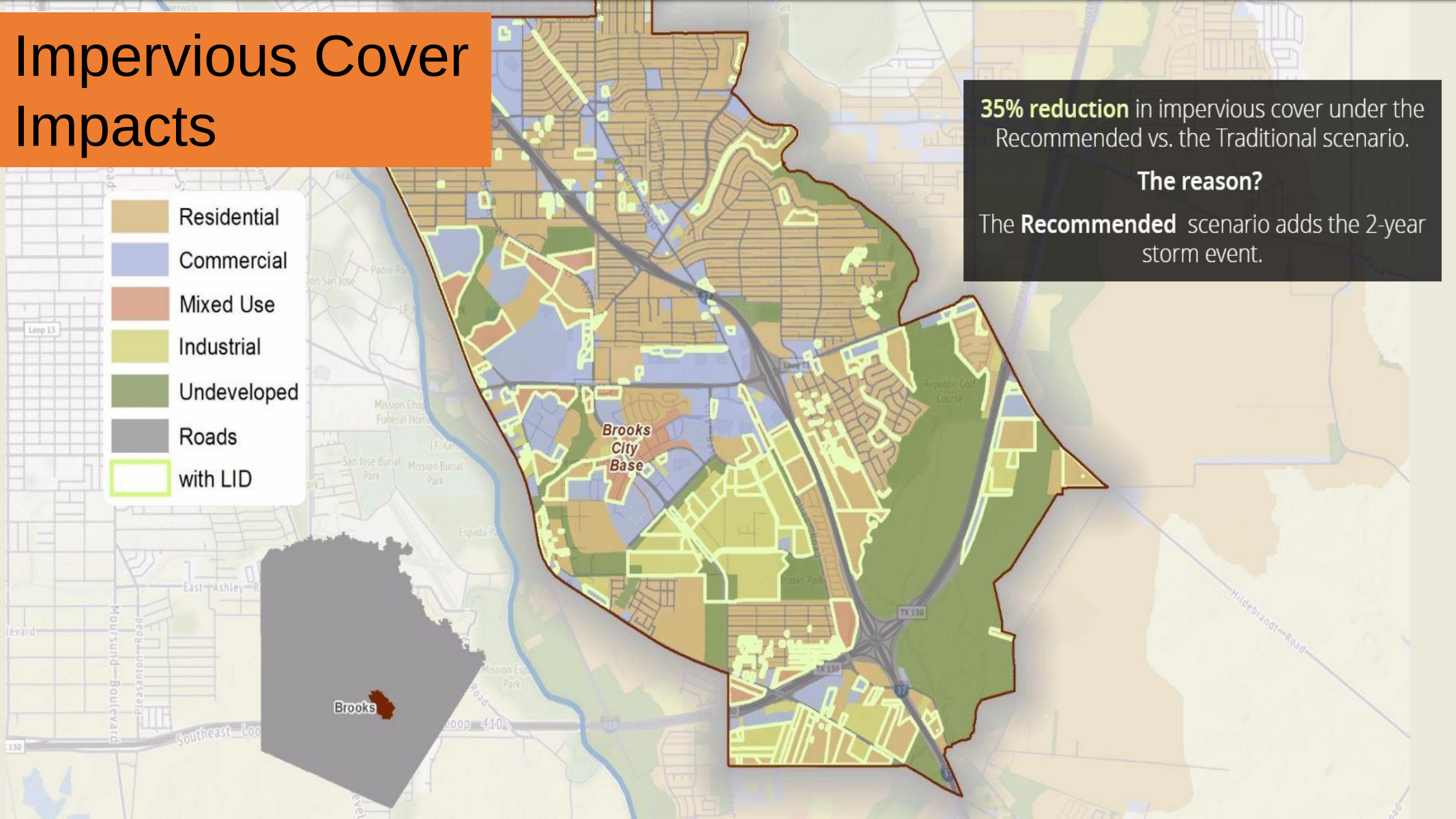
It is also adjacent to and has stream segments that drain to the **Mission Reach**.

Three Analysis Scenarios



Recommended Development Components

Impervious Cover Impacts

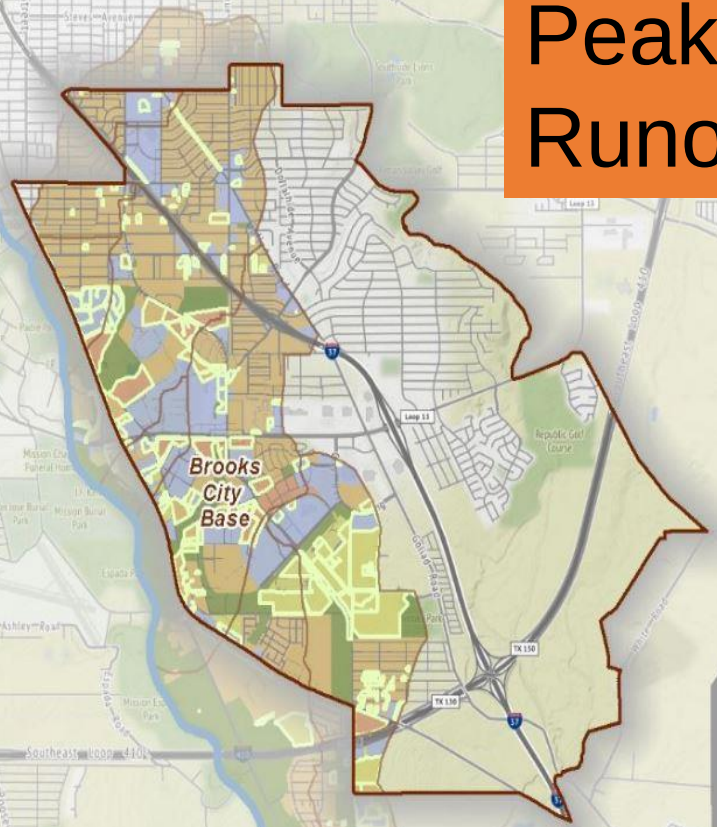


Peak Flow Runoff Impacts

Comparing **Future Scenarios** against **Existing**

Average Increase in Peak Flow Runoff

	2-year storm	100-year storm
Traditional	▲25%	▲10%
Recommended	▲6%	▲3%



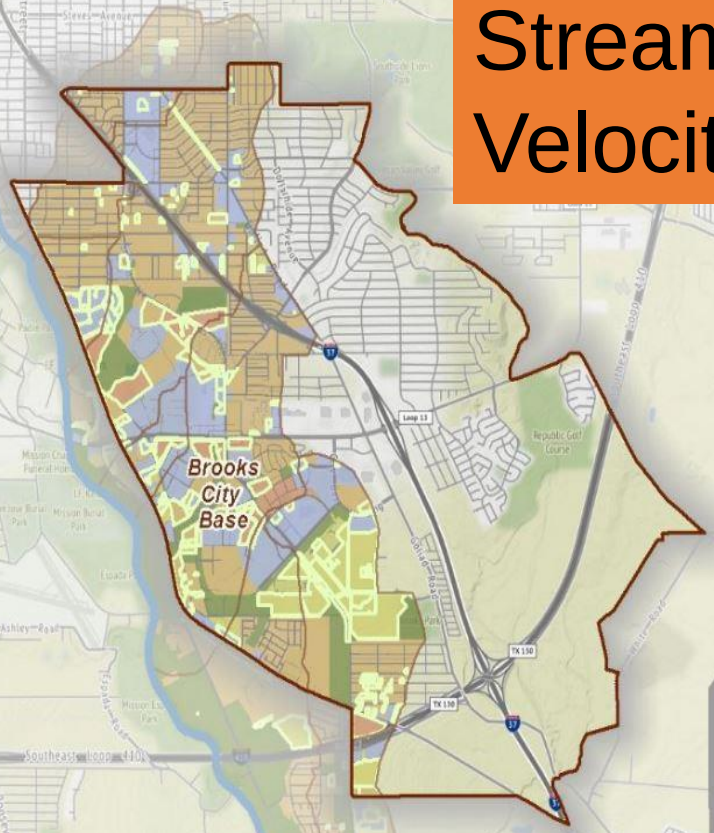
- Residential
- Commercial
- Mixed Use
- Industrial
- Undeveloped
- Roads
- with LID

Stream Flow Velocity Impacts

Comparing **Future Scenarios** against **Existing**

Stream Flow Velocities

	Max Increase	Average Increase
Traditional	▲14%	▲5%
Recommended	▲2%	▲0.9%



- Residential
- Commercial
- Mixed Use
- Industrial
- Undeveloped
- Roads
- with LID

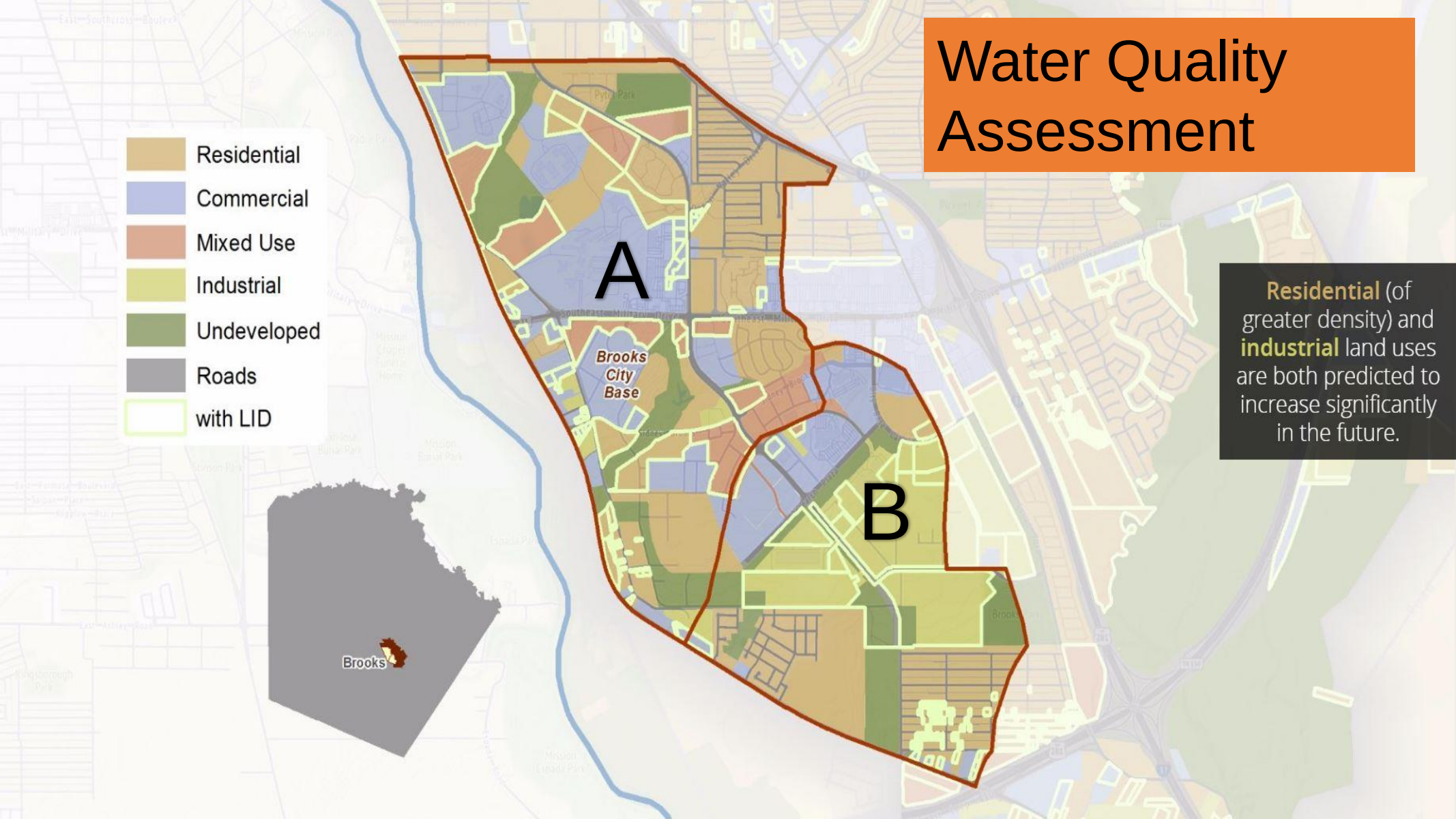
Street-level Flooding Impacts

Traditional development puts S. Presa under water during a **2-year storm** event and **worsened** existing flooding at Sidney Brooks and other crossings.

Street-level Flooding Impacts

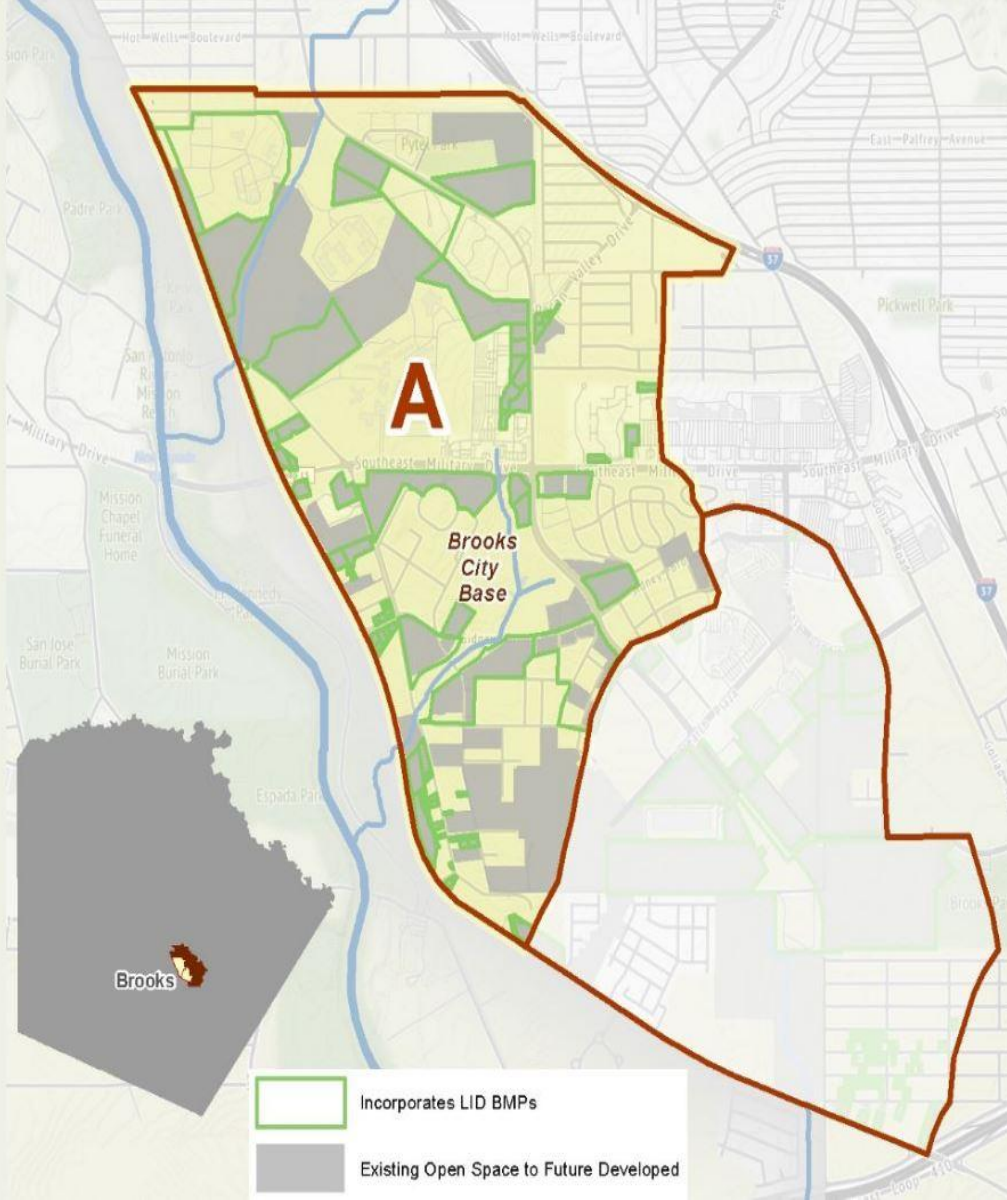
Recommended development allowed development to occur **without** impacting the roads along Brooks Creek.

Water Quality Assessment



Residential (of greater density) and **industrial** land uses are both predicted to increase significantly in the future.

Water Quality Impacts

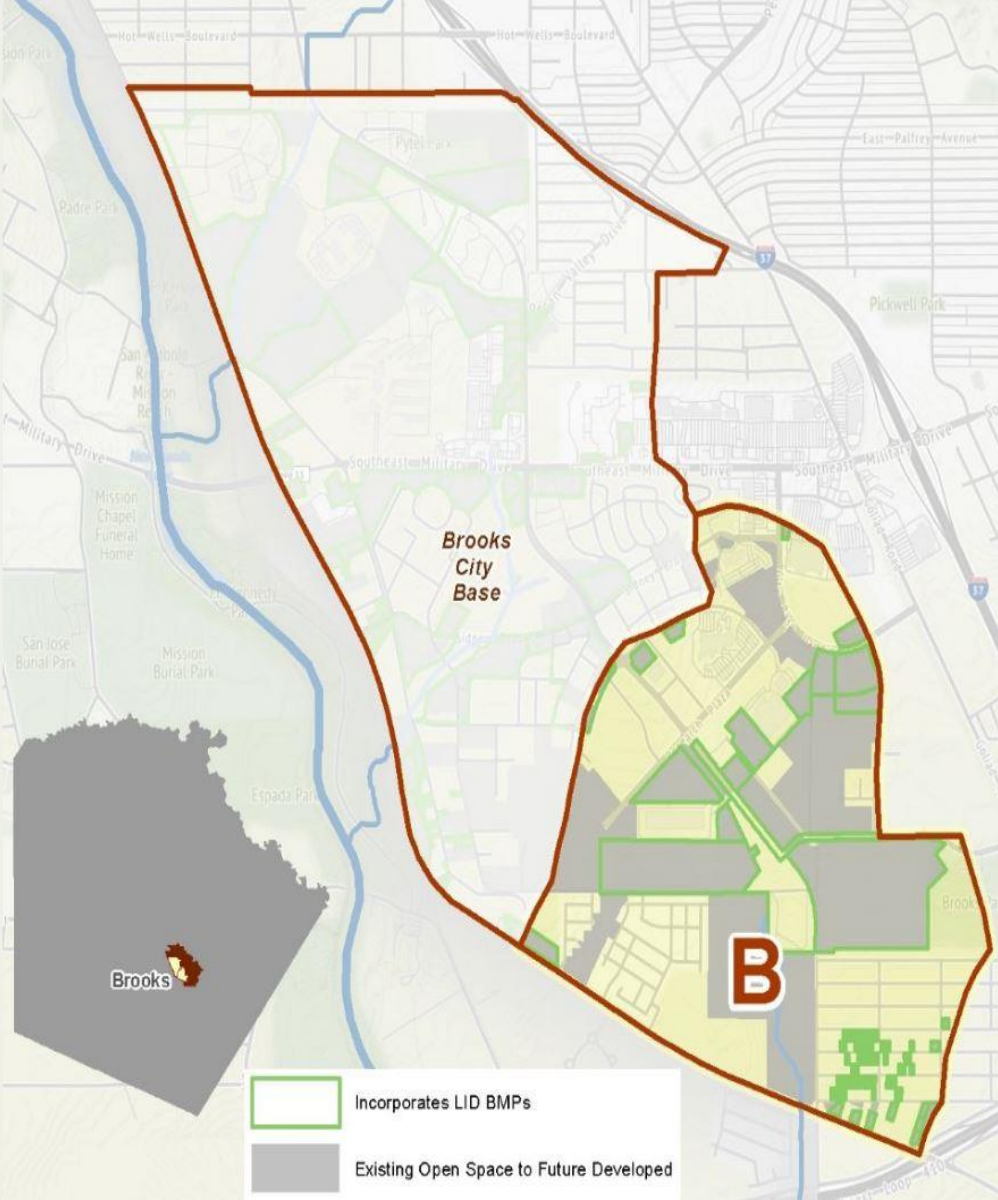


Comparison of **Existing** to **Future** Scenarios

Area A		
Existing to Traditional	Δ	Existing to Recommended
▲32% Impervious Cover	8%	▲24% Impervious Cover
=		=
▲44% *E.coli* load	30%	▲14% *E.coli* load

An increase in impervious cover corresponds with an increase in annual ***E. coli*** loads.

Water Quality Impacts



Comparison of **Existing** to **Future** Scenarios

Area B		
Existing to Traditional	Δ	Existing to Recommended
▲63% Impervious Cover	3%	▲60% Impervious Cover
=		=
▲56% *E.coli* load	33%	▲23% *E.coli* load

Area B had more development of **open space** converted to **other** land uses.

Construction Cost Impacts

Less impervious cover **saves money** by reducing the need for stormwater infrastructure.

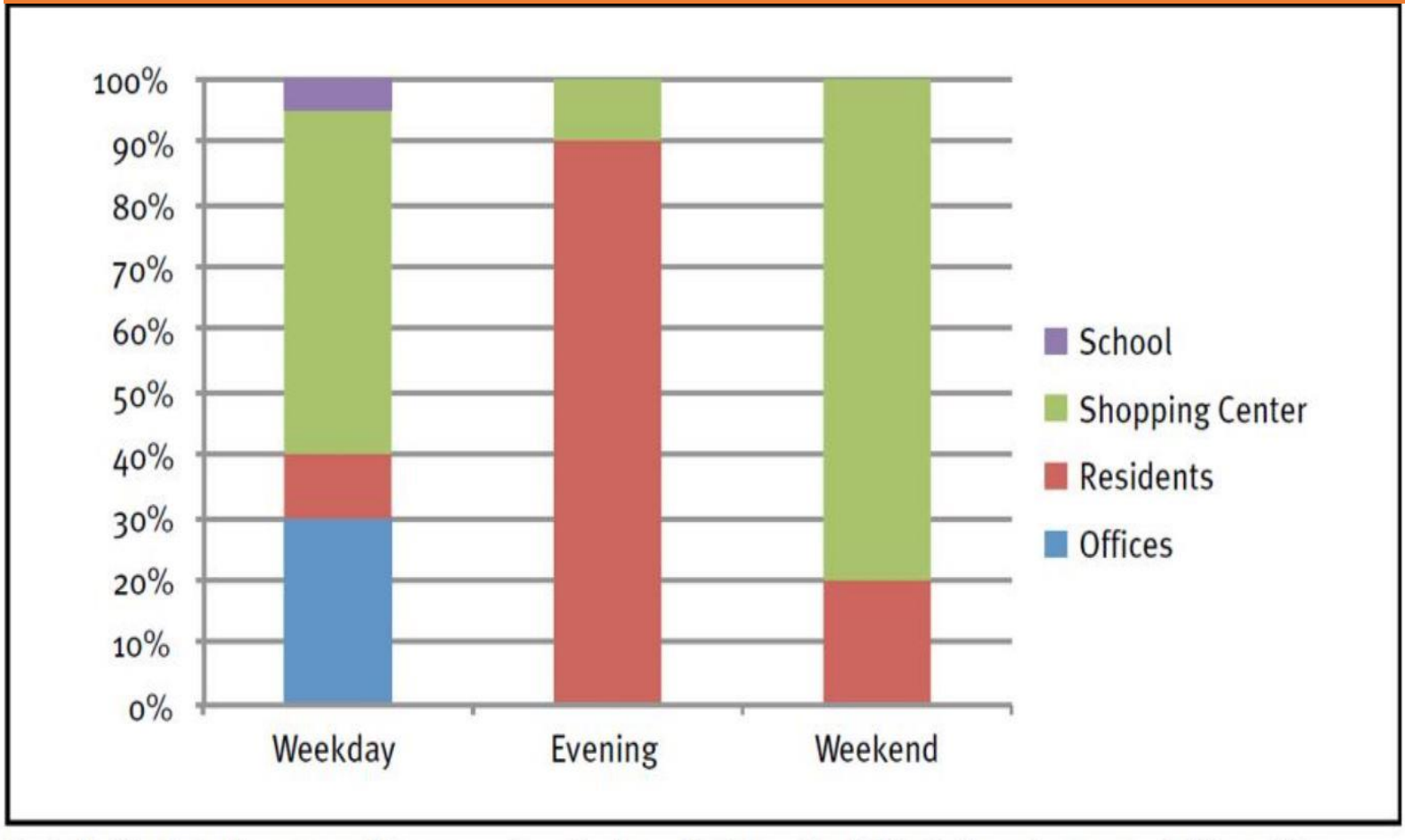
Traditional Scenario

$74,762,983

Recommended Scenario

$40,216,446

Parking Impacts



The table illustrates how 100 parking spaces in a mixed-use district can be distributed based on usage at different times.

Parking

Shared parking and park-once strategies resulted in a triple bottom line net value of **$7,312,493.**

Impacts from Complete Green Streets

Green streets have the **added benefits** of creating pleasant, walkable communities as well as treating stormwater runoff and improving air quality.

This strategy resulted in a **$7,803,121** triple bottom line net value compared to a strategy using more concrete and managed turf.

Conservation Residential Subdivision Impacts

Reduce infrastructure costs during building and are perceived as having a higher value compared to traditional neighborhoods.

This strategy resulted in **$5,955,886** in triple bottom line benefits.

Impacts from Trees!

For every 5% of tree cover, **stormwater runoff is reduced** by 2%.

Exhaust particulates are reduced 60% in tree-lined streets.

Every 10% increase in urban tree canopy **reduces ozone** by 3 to 7%.

Property values on tree-lined streets increase 5 to 15%.

Every $1 invested in trees brings a **return of $2.70.**

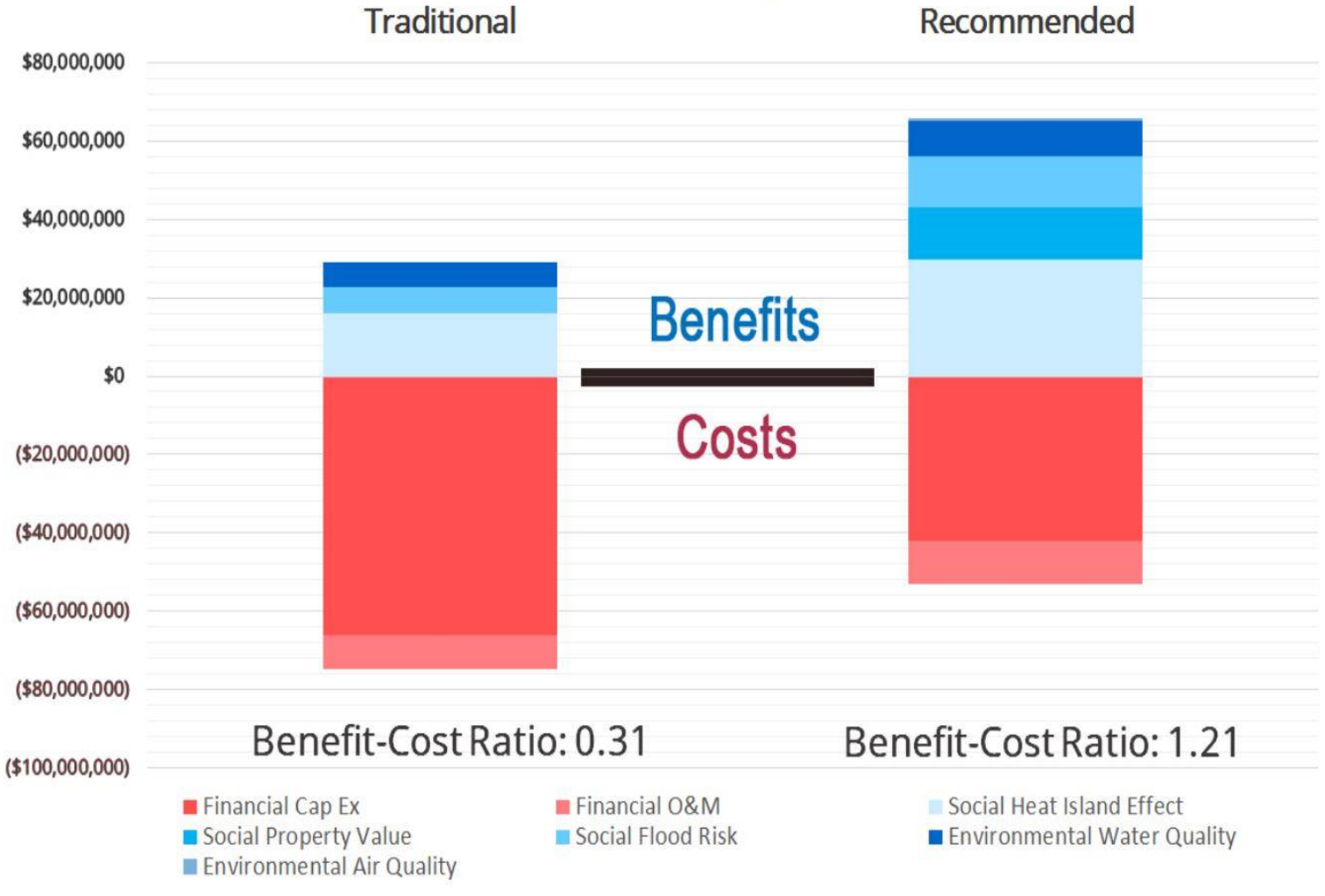
Carbon Sequestration

	Traditional Scenario	Recommended Scenario
CO2 (Metric Tons; 40 year totals)	238,089	495,470
# of Vehicles Emissions Sequestered Annually	1,266	2,635

This results in an additional **$10,411,061 in social benefits**

Air Pollution Sequestration (metric tons; total over 40 years)		
	Traditional Scenario	Recommended Scenario
O3	35.54	98.12
NO2	17.91	49.74
PM2.5	1.07	2.80
SO2	5.69	15.18

Cost/Benefit Comparison



Investing in the Future

The **Recommended** scenario provided over $60 million in social and environmental benefits associated with flood risk, heat mortality, and water quality while reducing grey infrastructure costs.

Policy Recommendations

Policy & Code

- Incorporate targeted water quality standards into the Unified Development Code for watersheds associated with high E. coli loads.
- Do not allow development in floodplains, and set aside other areas with permeable soils.
- Zone 100-year Floodplain as open space.
- Require assessment of the 2-year and other small, frequent storms for their impacts.
- Modify parking lot requirements to reduce minimums and to allow more flexibility in SA Tomorrow Place Types.
- Protect floodplains from fill and other modifications.
- Protect canopy within the stream buffer in and adjacent to floodplains.

SA Tomorrow Implementation Plan

- Incorporate into all Regional Centers the RECOMMENDED DEVELOPMENT strategies used herein to allow for development while mitigating development's impacts. This includes creating stormwater parks that utilize at least 1/3 of parklands to infiltrate stormwater runoff.

Other

- Prioritize placing green infrastructure into bond projects or publicly funded projects.

Building resilient communities where people want to live, work, and recreate!