

A scenic view of a lake with people sitting on the grassy shore, overlaid with text. The background shows a large body of water, a grassy bank with several people sitting on the grass, and a line of trees in the distance. The text is overlaid in white, bold, serif font.

# Impact of Highways on the Edwards Aquifer

Improving Transportation  
Without Putting Nature Second

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# Highway Environmental Impacts

- Edwards Aquifer
- Impacts
- Solutions
  - Conservation Planning
  - Conservation Banking
  - Interagency Coordination
- Solutions Cont'd
  - Wildlife Crossings
  - Public Lands
  - Native Vegetation
- Conclusion
- Recommendations

# Introduction

- Transportation projects often have major impacts on the environment
- The federal environmental review process, NEPA, has been unfairly blamed for causing project delays, and is the focus of several efforts to “streamline” the environmental review process
- TxDOT should begin any project planning that impacts the Edwards Aquifer by conducting a full Environmental Impact Statement.

# Highway Environmental Impacts

“...traffic and roads are strongly implicated in many of the major environmental problems faced by the United States today: air and water pollution, heavy energy use, fragmented farmlands and habitat, wildlife and biodiversity losses, and community disruption. In turn, these problems are adversely affecting human and ecosystem health and the nation’s overall quality of life.”

# The Many Threats of Transportation

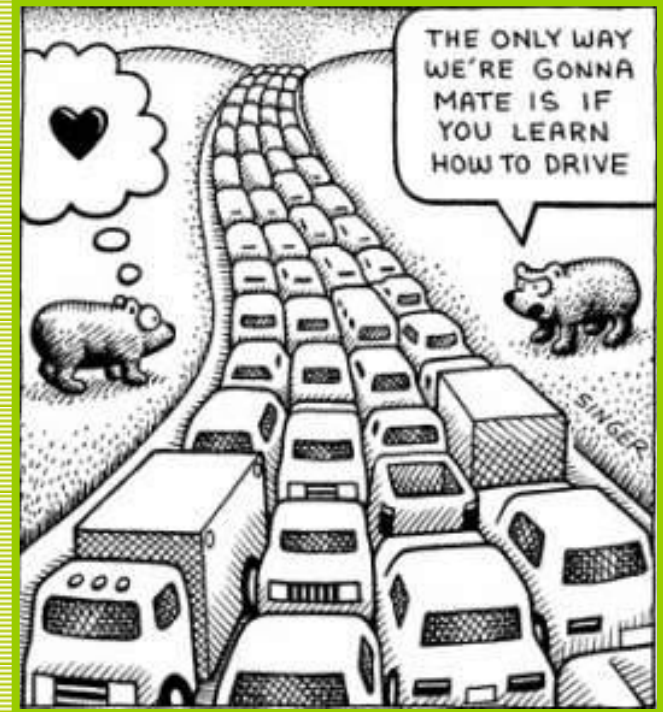
- Roadkill
- Habitat Loss
- Air and Soil Pollution
- Water Pollution
- Noise Pollution
- Invasive Species
- Sprawl



photo by Patricia White, Defenders of Wildlife

# Habitat Loss

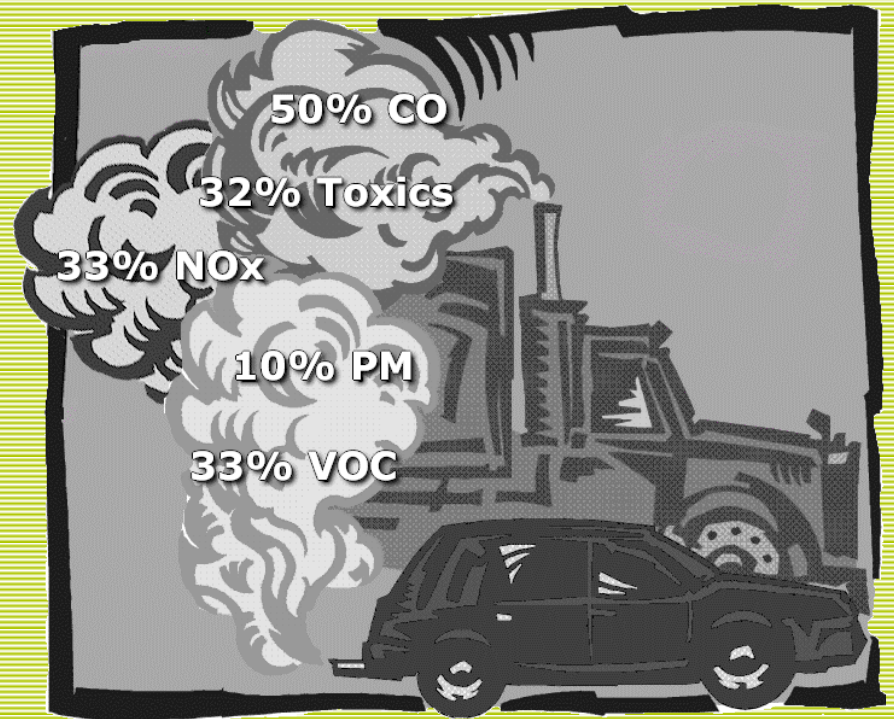
- The most significant threat to endangered species, imperiling 85% of those species
- Direct habitat loss
- Fragmentation
- Habitat degradation
- Road effect zone impacts 15 to 20 percent of the land area of the U.S.



Andy Singer

# Air and Soil Pollution

- Motor vehicles are a primary source of pollutants
  - One study of important roadside pollutants found that 83% came from cars and trucks
- Air pollutants
- Acid rain
- Toxics
- Heavy metals



# Water Pollution

- Roads and highways are impervious surfaces
  - A one-acre parking lot produces about 16 times as much runoff as a one-acre meadow
  - When more than 10% of a watershed is covered by impervious surfaces, waterways become biologically degraded
- Erosion
- Nutrient loading
- Heavy metals and other pollutants



# In the Edwards Aquifer Recharge and Contributing zones

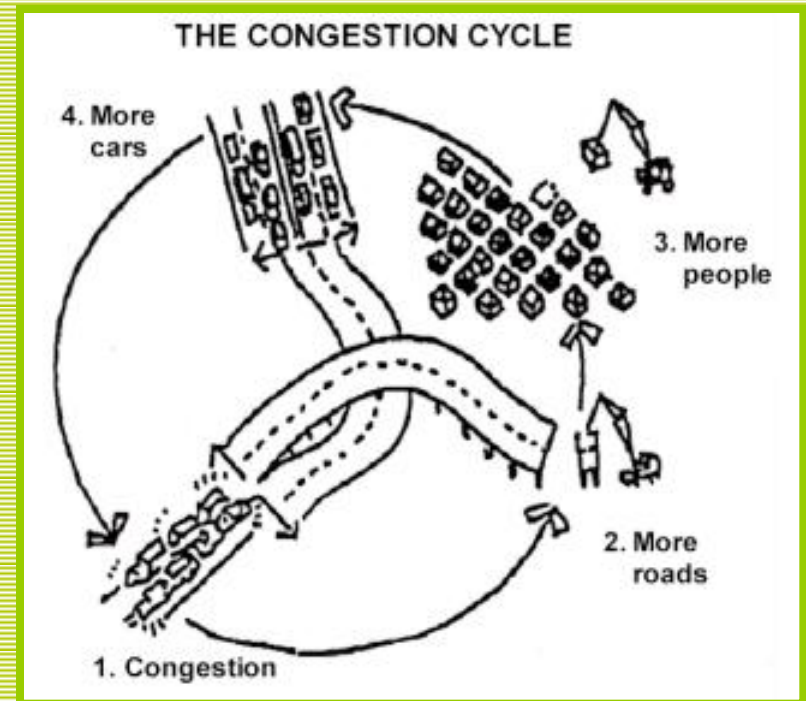
- – Increased Impervious Cover Leads to Downstream Flooding
- – Increasing Urbanization of the Edwards Region is Impairing Water Quality

- Largest springs in Texas
- Cities and towns

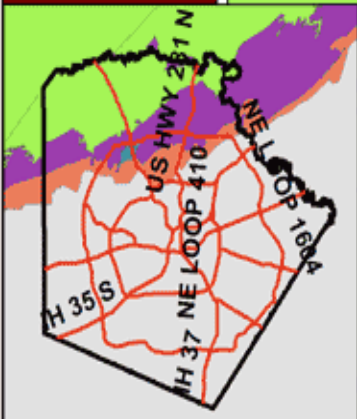


# Sprawl

- Roads and highways facilitate development
  - Highway-oriented development tends to be auto-oriented and low density
  - Sprawling development encourages more driving
  - Sprawling development leads to more road-building



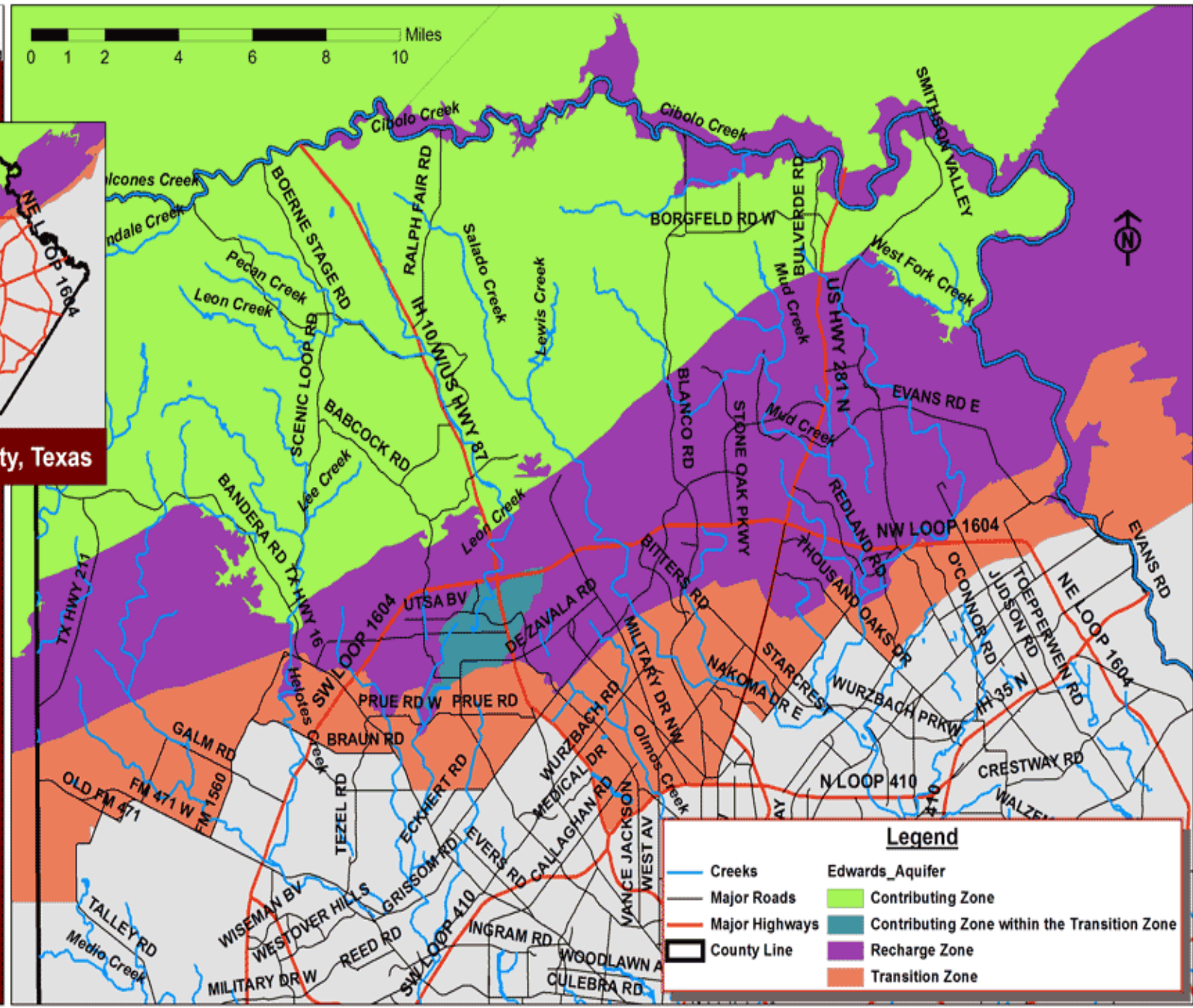
Adapted from the Greenbelt Alliance, *Reviving the Sustainable Metropolis: Guiding Bay Area Conservation and Development into the 21<sup>st</sup> Century* (San Francisco: Greenbelt Alliance, 1989), p.9



Bexar County, Texas

# Edwards Aquifer in Bexar County, Texas

October 7, 2005

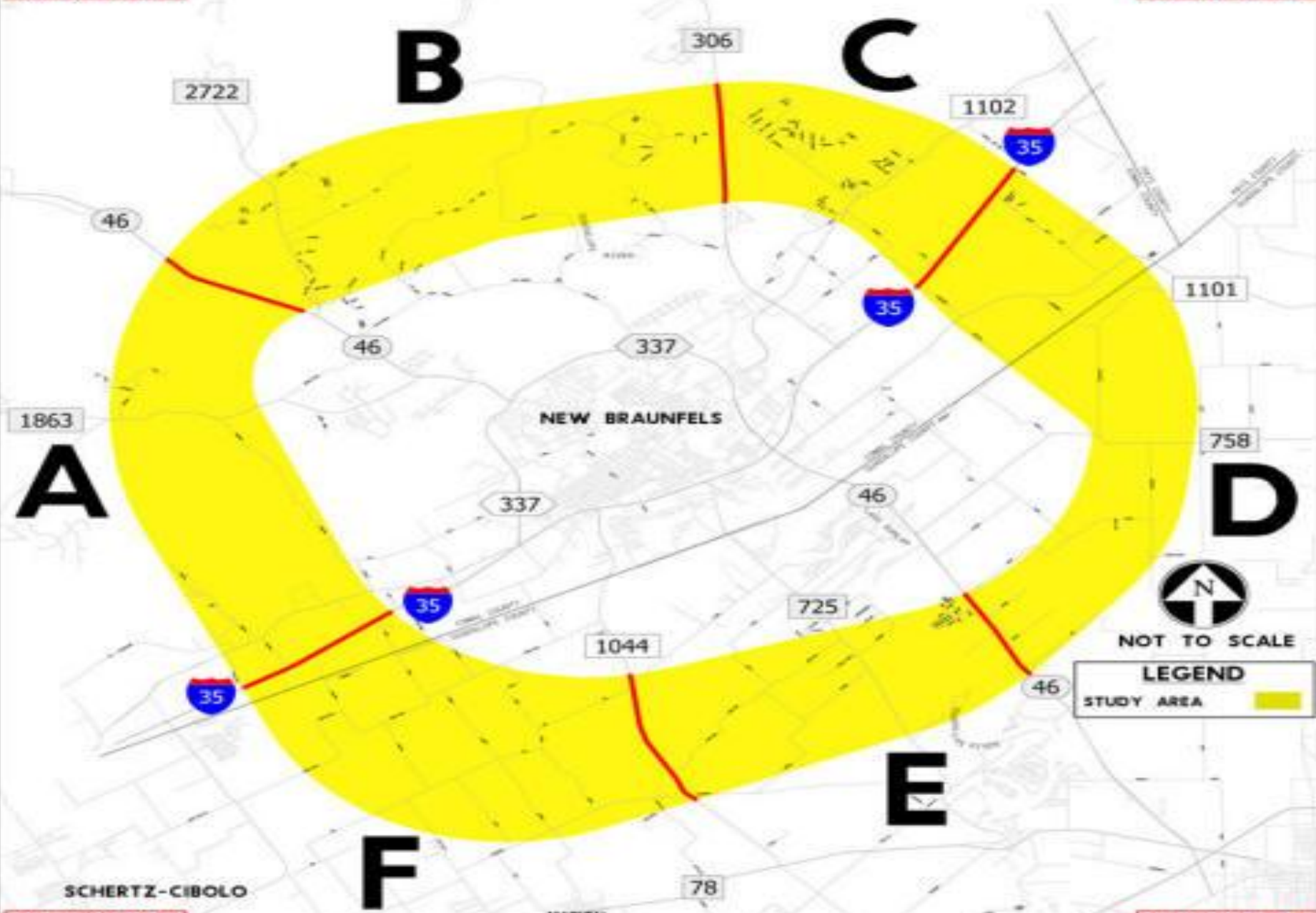


**Legend**

	Creeks		Edwards_Aquifer Contributing Zone
	Major Roads		Contributing Zone within the Transition Zone
	Major Highways		Recharge Zone
	County Line		Transition Zone

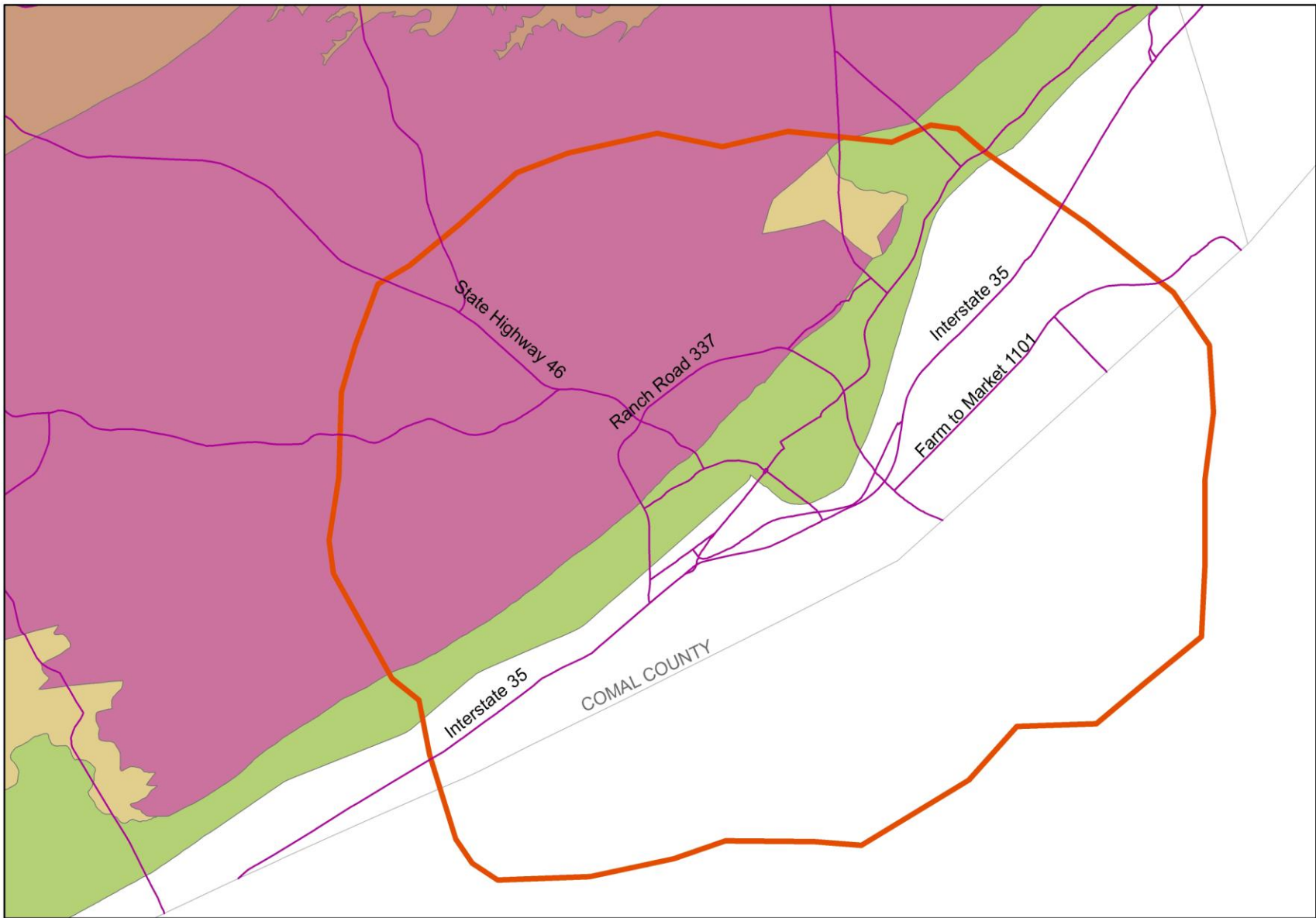
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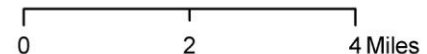
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# Recommended New Braunfels Outer Loop and the Edwards Aquifer

-  Recommended Outer Loop
-  Edwards Aquifer Recharge Zone
-  Edwards Aquifer Transition Zone
-  Edwards Aquifer Contributing Zone
-  Edwards Aquifer Contributing Zone Within the Transition Zone



# Solutions

- Some states have attempted to lessen the environmental impacts of transportation projects through:
  - Integrated Planning
  - Conservation Banking
  - Interagency Coordination
  - Wildlife Crossings
  - State of the Art Transportation Strategies
  - Use of Native Vegetation

# Where Do We Go from Here?

- Focus on improving existing local streets, intersections, traffic signals, sidewalks, transit and bicycle facilities
- Avoid any expansion of road pavement over Edwards recharge area and manage access of Hill Country road system
- Highway expansions should be related to specific economic development projects
- Support the development of denser, walkable urban neighborhoods with mixed land uses
- Get ready for higher gasoline prices and carbon emission limits



# State of the Art Transportation Strategies

- access management,
- advanced traffic signal coordination
- metering and variable speed limits
- HOV and reversible commuter lanes
- dedicated rapid mass transit
- and other state of the art alternatives that, if implemented, could negate the need for expansion of the roadway over this extremely sensitive area.

# Integrated Planning

- An approach that coordinates habitat conservation, land use, and transportation
- Occurs in advance of project development
- Uses GIS mapping to identify potential conflicts

# Recommendations for Integrated Planning

- Utilize existing landscape-level conservations plans
- State Agencies (TCEQ and EAA) should adopt & enforce Strict Impervious Cover Limits on the Edwards Recharge and Contributing zones
- Identify mitigation sites or banks in advance of project impacts
- Provide adequate training on the incorporation of conservation planning
- Monitor planning initiatives
- Involve the public

# Conservation Banking

- Large, contiguous areas of viable habitat are purchased and protected in anticipation of future demands for transportation project mitigation
- Where a project has impacts that cannot be avoided, the sponsoring agency can apply mitigation credits earned under the conservation bank
- Conservation banking is proactive rather than piecemeal

# Recommendations for Conservation Banking

- Use conservation banking only when avoiding and minimizing impacts is impossible
- Create a revolving fund to help Comal County acquire habitat
- Use conservation plans to identify the most ecologically valuable lands for banking
- Site conservation banks strategically
- Develop a statewide MOU among all involved parties
- Solicit funding from Farm and Ranch Protection Program and other sources to match County funds.

# Opportunities for Conservation Easements in the Edwards Aquifer /Hill Country Region

- Require adherence to Endangered Species Act

## Including:

- Requiring habitat assessment for new projects and development

- Requiring mitigation of habitat “takings”

- Use conservation plans to identify land banking opportunities
- Establish transfer of development rights (TDR) program in tandem with strict impervious cover limits to encourage conservation banking
- Adopt Aquifer Protection Initiatives for New Braunfels and Comal County

# Recommendations

- Maintain roads in an environmentally-sensitive manner, and use only native species in ROWs
- Practice context-sensitive solutions
- Weigh the need for additional roads against environmental impacts
- Increase public awareness of wildlife and environmental needs
- Provide alternatives to driving

- Reauthorize and fully fund the National Scenic Byways, Emergency Relief for Federally–Owned Roads, Recreational Trails, and Transportation Enhancements programs
- Provide dedicated funding for alternative transportation



# Conclusion

- Conflicts between transportation and environment have never been greater
- Current efforts to weaken NEPA will do little to improve project delivery and could seriously jeopardize the natural and cultural resources
- Instead, many states and agencies are beginning to recognize that there are ways to both meet transportation needs and do a better job of protecting environmental and cultural resources

# Conclusion Cont'd

- States and agencies can meet these dual goals through innovative practices such as:
  - Comprehensively planning for biodiversity conservation
  - Proactively mitigating environmental impacts through conservation banking and wildlife crossings
  - Improving coordination among transportation and resource agencies
  - Promoting alternative transportation on public lands
  - Promoting the use of native vegetation

# For More Information...

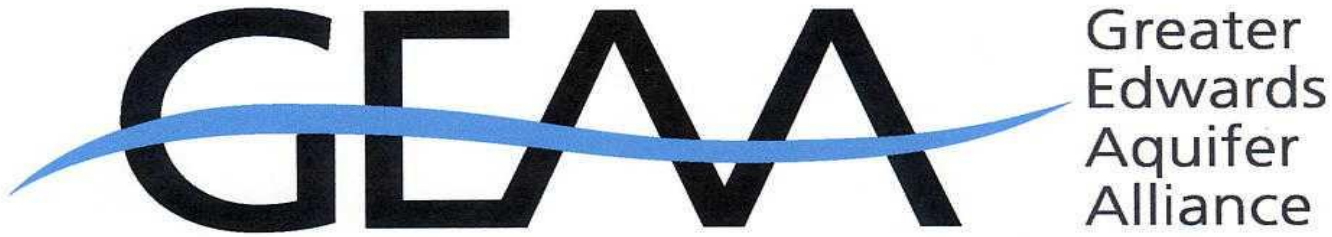


Habitat and Highways Campaign

[www.defenders.org/habitat/highways](http://www.defenders.org/habitat/highways)

surface transportation  
policy project

[www.transact.org](http://www.transact.org)



The Greater Edwards Aquifer Alliance is a coalition of 43 member groups formed to protect the Edwards Aquifer and its contributing Hill Country watersheds.

For more information visit our website at

**[www.AquiferAlliance.org](http://www.AquiferAlliance.org)**