EXECUTIVE SUMMARY

The United States is approaching a crossroads — unimpeded urbanization may soon collide with the limits of our country's natural resources. The rate of this urbanization surpasses population growth, and threatens to overwhelm previous victories in environmental protection. Biological diversity — the rich variety of natural species that forms our natural life support system — is in jeopardy. The most significant threat to America's biodiversity is habitat loss, and one of the greatest consumers of habitat is poorly planned, sprawling development.

Over the next few decades, America can avert this collision between growth and biodiversity. Because transportation infrastructure necessarily precedes development, current transportation planning will shape future urban growth. State transportation agencies and planners can steer investment *toward* greater mobility for better communities and *away* from impacting our remaining natural areas.

Some state and local agencies are virtual laboratories for progress; going above and beyond regulatory requirements and paving the way for others to follow. Federal policy can either help or hinder this leadership. Reauthorization of the Transportation Equity Act for the 21st Century (TEA-21) provides a great opportunity for Congress to enable and encourage stewardship and innovation at the state and local levels.

Mobility does not have to come at the expense of biodiversity. *Second Nature: Improving Transportation Without Putting Nature Second* profiles innovative programs that seek to improve transportation infrastructure while protecting biodiversity. Because this concept is relatively new, many of the case studies are still in the early stages. While outcomes are uncertain, each of the programs exemplifies the creative cooperation necessary to affect change. With support, these innovative practices can become "second nature" to transportation and resource professionals across the nation.

IMPACTS

Because both mobility and biodiversity are national priorities, it is necessary to understand how they interact. Until recently, our understanding of how nature degrades roads far outweighed our understanding of how roads degrade nature. For example, road salt protects drivers from ice, but damages waterways. Similarly, fencing controls access to highways, with little regard for the effect that such barriers have on wildlife.

Road ecology, a new field of study, seeks to explain the complex relationship between roads and the natural environment. A road's environmental footprint extends far beyond the edge of its pavement. In fact, nationwide

PATRICIA WHITE, DEFENDERS OF WILDLIFE

the "road-effect zone" is estimated to be 15 to 20 times as large as the actual paved right of way.

Transportation infrastructure has significant direct and indirect effects on the natural environment. Roads directly affect wildlife habitat, ecosystems, and water quality through land consumption, roadkill, habitat fragmentation, and replacement of natural cover with impervious surfaces and invasive species. Poorly planned roads and highways open up vast areas of wilderness and farmland to sprawling residential and commercial development.

INTEGRATED PLANNING

State and federal agencies spend considerable time and capital both protecting natural areas and building transportation infrastructure. Unfortunately, conservation and growth efforts often happen independently and then come into conflict during the permitting and construction phases of a transportation project. But, if conservation efforts are taken into account at the earliest stages of transportation planning, both priorities can be realized, in less time and at less cost.

Florida's Efficient Transportation Decision Making Process (ETDM) overlays maps of strategic habitats with transportation plans, identifying potential environmental concerns at the earliest stage of planning. In Arizona, local officials are using the Sonoran Desert Conservation Plan to "broaden the vocabulary of the growth debate to include biological and scientific concepts, and reframe the elements of regional planning to encompass the relation that the land has to natural and cultural resources." Across the U.S., states are developing comprehensive wildlife conservation plans under the Department of Interior's State Wildlife Grants Program. In addition, Heritage Programs and The Nature Conservancy identify and map areas that need to be protected to ensure the survival of each ecoregion's biological diversity.

CONSERVATION BANKING

Transportation projects are required to compensate for adverse environmental impacts in a process known as mitigation. Traditional compensatory mitigation is conducted on-site, on a project-by-project basis. Because such small-scale mitigation is expensive and rarely ecologically sound, mitigation banking is often used

to compensate for wetland loss. Large, contiguous wetlands are created or restored to earn advance mitigation credits for future impacts elsewhere.

Although wetland mitigation banking has been heavily criticized, the practice is now being applied to other ecosystems. Much like wetland banking, conservation banking proactively preserves large tracts of habitat to offset the adverse impacts of future development projects. For a variety of reasons, banking may be a more appropriate tool for non-wetland habitat conservation. Through a combination of comprehensive large-scale planning and a coordinated mitigation strategy, states and communities can reduce the conflict between development and conservation aims.

In a handful of states, transportation agencies are developing conservation banks to more effectively mitigate impacts, while also controlling costs and improving project delivery. Colorado Department of Transportation is protecting shortgrass prairie and North Carolina DOT has banked habitat for the endangered red-cockaded woodpecker. And in California, where some state laws are stricter than federal, conservation banking is widely used to compensate for the impacts of road projects.

INTERAGENCY COORDINATION

Lack of coordination among federal, state and local agencies can delay transportation projects and cause unnecessary loss of wildlife habitat. Early involvement allows natural resource agencies to identify potential conflicts and helps planners develop projects with minimal environmental impact.

In response to guidelines set forth in TEA-21, several state transportation agencies initiated formal or informal partnerships with resource agencies. Oregon's Collaborative Environmental and Transportation Agreement for Streamlining (CETAS) program establishes a working relationship between ODOT and ten state and federal transportation, natural resource, cultural resource, and land-use planning agencies. California's Tri-Agency Partnership Agreement was born out of the recognition that transportation projects, especially those that promote environmental objectives, need to be delivered in a timely fashion, and that improved collaboration among the three agencies is central to achieving that goal.

WILDLIFE CROSSINGS

Because roads are such prominent — and permanent — parts of the landscape, expanded methods are needed to reduce their effects on surrounding ecosystems and make them more permeable for wildlife on the move. Solutions range from reducing speed limits and adding cautionary signage to building passages. Wildlife crossings are not a panacea, but they can go a long way toward reconnecting fragmented habitat.

Several European countries and Canada have built wildlife passages to reestablish habitat connectivity across existing roadways. In

PATRICIA WHITE, DEFENDERS OF WILDLIFE

the U.S., Florida is leading the way with wildlife passages throughout the state for species such as the endangered Florida panther and the Florida black bear. Currently, Montana DOT is incorporating 42 wildlife passages, from small fish culverts to an open-span overpass, in the reconstruction of US 93.

PUBLIC LANDS

Federal lands, including national parks, forests, wildlife refuges and monuments constitute one quarter of the United States and provide habitat for nearly two-thirds of all threatened or endangered species. Publicly owned lands are critical for biodiversity conservation, but also support local economies through travel and tourism.

Federal Lands Highway Program (FLHP) maintains 90,000 miles of roads on public lands. Because FLHP has been largely devoted to building roads instead of providing access and mobility, vehicle overcrowding, traffic and air pollution continue to degrade the visitor experience and drive away wildlife.

To maintain both mobility and biodiversity, roads on public lands must be maintained in a manner consistent with surrounding resources and visitors must be given environmentally sensible transportation options. Some national parks now provide visitor friendly and environmentally sensible transportation options such as shuttle buses, ferries and bicycle and pedestrian trails. The Santa Ana National Wildlife Refuge in Texas utilizes a public-private partnership to provide wildlife-friendly transportation in the refuge and revenue to the local economy.

NATIVE VEGETATION

After loss of habitat, invasive species represent the greatest cause of species endangerment and decline in the U.S. Invasive species are responsible for at least $137 billion a year in economic losses. Nearly 50 percent of species on the endangered or threatened species lists are at risk because of non-native species.

Because they disturb natural habitats, transportation systems facilitate the spread of plant and animal species outside their natural range. With 12 million acres of land contained within public rights-of-way, transportation agencies are also land managers on a grand scale. Too often, the objective of roadside vegetation management has been to establish an inexpensive, attractive and fast-growing slope stabilizer. Where native flora was too costly, grew too

slowly, or was deemed unattractive, non-native species were often planted.

Given the widespread threat of invasive species, resource managers and transportation agencies have a responsibility to first stop adding to the problem. Second, they must attempt to repair the damage that has already been done. Finally, where possible, roadsides should be enhanced to restore the ecological value they once had. Public rights-of-way must be managed as a valuable resource with the most positive impact on the environment and the economy.

Many states have made great strides in native roadside vegetation management. Through Iowa's Living Roadway Program, roadside vegetation is maintained so that roadways are safe, visually interesting, ecologically integrated and useful for many purposes.

RECOMMENDATIONS

1. Integrate conservation planning into transportation planning.
2. Use conservation banking in concert with large-scale conservation plans to mitigate unavoidable impacts of transportation.
3. Coordinate with resource agencies early, substantively and continuously throughout transportation planning and project development.
4. Build wildlife crossings where necessary to repair ecological damage and restore habitat connectivity.
5. Provide alternative transportation and maintain roads on public lands in a manner consistent with surrounding natural resources.
6. Use only native species in roadside vegetation management.