

AASHTO NATIONAL ENVIRONMENTAL STEWARDSHIP COMPETITION

Please check the appropriate category for which you are submitting the application:

- Category:** Project
 Program
 Institutionalization/Organization Change

Application Title: US-1 Key Deer Wildlife Crossings, Big Pine Key, Florida

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*In no more than five pages, please provide the following information**. Although the same questions are asked for each category of application, the answers should appropriately focus on the type of stewardship application being submitted.

In answering, please respond in order and number your response to coincide with the numbers of the questions/topics listed below. Also, please utilize the text boxes that appear beneath each of the questions. The boxes will expand automatically as you enter your information.

1. 1. Describe the project/program/initiative/policy, including when it was initiated and its current status (adopted plan or policy, completed construction, etc.)

The project, located along US-1 between Mile Markers (MM) 29.5 and 33, consists of the implementation of a wildlife crossing system for Key deer. The Federally-endangered Key deer is found primarily on Big Pine Key, which is traversed by US-1 (SR 5) for a distance of 3.5 miles. Over half of all Key deer roadkills occur along US-1 in Big Pine Key. Even though other threats to the Key deer population exist (primarily habitat loss), the FDOT is committed to reducing the number of Key deer deaths due to vehicular collisions on US-1. The project study was initiated in September 1993 and construction was completed in January 2003.

Improvements that were implemented between MM 31 and 33, within the “undeveloped” segment of US-1 (where natural, mangrove wetland areas occur), consist of the following:

- a. Two **underpasses**, one mile apart, at areas of high road mortality (MM 31.5 & 32.5), to provide safe crossing opportunities for Key deer. Each of these concrete bridge structures provides an effective crossing width of 25 feet and height of 8 feet.

b. **Fencing** along the US-1 corridor, to prevent Key deer from having unrestricted access to US-1, and to help direct Key deer toward the underpasses. This vinyl-covered, chain link fencing is eight feet in height, and has four inches of clearance from the ground to allow movement of the Federally-endangered Lower Keys marsh rabbit. The fencing is continuous, except for (five) access points intersecting US-1, where deer guards must be utilized.

c. **Deer guards** installed at the (four) side roads that intersect US-1 and one across US-1 (at the MM 31 project terminus), to prevent Key deer from gaining access onto US-1. These consist of steel grid decking, tailored to the width of the roadway, having a standard length of 25 feet.

d. Creation of a **travel corridor** parallel to the fencing, implemented between MM 31 and MM 33, to promote Key deer utilization of underpasses. The corridor was created through selective trimming of mangrove wetland vegetation along the outside (not on the roadway side) of the fencing.

Improvements that were implemented between MM 29.5 & 31, within the segment of US-1 where adjacent development exists, were solely non-structural, and consist of the following: **Special Key Deer signage** (some with **flashing lights**), and **special pavement markings** (“**DEER XING**”). Their purpose is to improve driver awareness and reduce probability of accidental collisions between Key deer and motorists.

2. 2. Describe the context within which this project/program/initiative was implemented. For example, was it implemented in response to public opposition to agency actions, legislative mandate, agency leadership, staff initiative, etc?

In the late 1980's, as a result of growing public concern regarding mortality of endangered Key deer due to vehicular collisions, various measures were implemented by FDOT along US-1 in Big Pine Key. These measures included: speed limit reductions, establishment of a no-passing zone, deer crossing signage, and a roadside clear-cut maintenance program.

In 1993, the FDOT's Central Environmental Management Office (EMO), recognizing the need for a concerted effort, asked the FDOT's District Six EMO to convene a stakeholders' meeting. This proactive effort resulted in the subsequent formation of the *Key Deer Ad-Hoc Committee*. This committee, composed of various agencies and interested parties (e.g., non-governmental organizations), met in 1993-1994 and developed recommendations on how to resolve the issue of Key deer mortality due to vehicular collisions on US-1 in Big Pine Key. Significantly, this effort was initiated in the absence of any roadway project.

In addition, ISTEA funding became available for projects that "...mitigated hazards caused by wildlife...". And, the FDOT had successfully constructed wildlife crossings for other Federally-listed species (e.g., Florida panther, Florida black bear).

3. 3. Describe the process that was followed in implementing the project/program/initiative, with special emphasis given to participation of key partners.

The process consisted of ten years of continuous coordination by FDOT with agencies (e.g., U.S. Fish & Wildlife Service, Florida Game & Freshwater Fish Commission), stakeholders (e.g., Key Deer Protection Alliance), and the public, as well as continued involvement by the leading authorities on Key deer biology, during all project phases:

Concept Study (1995-96): This study, funded by FDOT, occurred subsequent to the final *Ad Hoc Committee* meeting, to evaluate viable alternatives to reduce Key deer/vehicular mortality on US-1. Consensus building via continuous public involvement and agency coordination occurred; the study recommendation (installation of two wildlife crossings) was scientifically-based.

- PD&E Study (1997-99): A conceptual engineering alternative was developed based on the *Concept Study's* recommendation. The final solution had to provide for a reduction in highway mortality of Key deer, but allow deer to cross US-1 (in order to access habitat on both sides of the roadway); while increasing drivers' safety, and minimizing other environmental impacts (e.g., habitat fragmentation, loss of wetlands). As part of this study, the FDOT deliberately did not include any provisions for capacity improvements to US-1 (an ongoing controversial issue). Extensive public involvement and formal Section 7 consultation with the U.S. Fish & Wildlife Service (FWS) occurred throughout this study.

- Final Design (1999-2001): Further refinement of the PD&E Study's alternative and continued public involvement occurred. Due to various design changes, new information (i.e., updated research on the Key deer population), and potential controversy, FWS advised FHWA/FDOT to reinitiate formal Section 7 consultation. Specific design issues were resolved (e.g., exact location of crossings, alteration of one deer guard's dimensions at a constricted access point, location of fencing, etc.).

Because no proven deer guard design existed (and the traditional cattle guard could not be utilized due to the Key deer's smaller hoof size) this element was considered by FWS to be the "fatal flaw" for the project. Thus, research to develop the most effective deer guard design prior to installation on the project was required. Testing of the actual deer guard material to be used on the project (grid dimension of 3.75 square inches, with diagonal members) was conducted by Texas A&M University, using Key deer on Big Pine Key. Environmental permitting was required, due to mangrove wetland impacts that were incurred from construction of both crossings and clearing of the deer travel corridor. During the permitting process, concerns were raised by the Key Deer Protection Alliance, but were resolved via permit conditions.

- Construction (2002-2003): The sequencing of project elements was implemented: first, both crossings were constructed simultaneously; then the deer guards were installed; and lastly the fencing (including the travel corridor). Importantly, the duration of construction was only 9 months, which minimized the potential for deer deaths (the FDOT gave a bonus incentive to the contractor, who brought the project in on time and under budget).

Monitoring during construction occurred (as committed to the FWS), in order to determine construction impacts on Key deer and Lower Keys marsh rabbit. There were no marsh rabbit deaths and 9 deer deaths (7 during road/crossing construction and 2 during fence installation) during the construction period. Prior to construction, at least 15 deer deaths per year occurred along this segment of US-1.

Since the FWS manages the National Key Deer Refuge, that encompasses much of Big Pine Key, continuous coordination with FWS at all phases of project development occurred. In addition, all project team members, including FDOT EMO/design/construction staff as well as all consultants, took special ownership in the project and did everything possible on their part to resolve any problems that arose.

4. 4. What are the major characteristics of this project/program/initiative that relate most readily to environmental stewardship?

The FDOT took responsibility to develop a means to reduce mortality of Key deer due to vehicular collisions on US-1 in Big Pine Key. This effort was initiated primarily for the purpose of benefitting an endangered species; there was no regulatory requirement to implement the project. It was done **in the absence of any roadway improvement project**, so there was no transportation benefit. The resultant solution constituted the successful balancing of the (often competing) needs of the motoring public, businesses, residents, and the environment.

Although impacts to mangrove wetlands were necessary in order to construct the wildlife crossings, these impacts were allowed by the regulatory agencies in order to achieve a “greater environmental good” (i.e., enabling safer movement of an endangered species). Mitigation was done for these impacts, through restoration/creation of mangrove wetlands within the National Key Deer Refuge.

The FDOT formed a collaborative partnership with FWS, and committed to consultation with FWS if there is failure of the crossing system to function properly. This includes modification or removal of the deer guards/fencing if they fail to function properly. In addition, during the project’s development, the FDOT funded four research projects related to Key deer and Lower Keys marsh rabbit.

5. 5. Describe why you believe this project/program/initiative represents a long-term commitment to environmental stewardship in your agency.

The project is designed as a **permanent solution** to minimizing Key deer mortality along US-1 on Big Pine Key, by providing safe passage under the US-1 roadway. The project also restored areas of biological connectivity for Key deer habitat that had been bisected by US-1 in the 1930’s. It represents FDOT’s dedication to work with the local community, regulatory agencies, and the FWS to implement a plan that maintains the continuity of vehicular traffic, while achieving the objectives of significantly reducing mortality of the Key deer and providing the deer safe access to a large portion of their habitat.

The FDOT’s initiative resulted in improved trust and strengthened the relationship between FWS and FDOT. This partnership will continue indefinitely, and includes various long-term commitments made by FDOT:

- Long-term monitoring will occur to evaluate the utilization of the crossings by the Key deer and the subsequent reduction in mortality from vehicle collisions on US-1.
- Modification of the crossing elements will occur if FWS deems it necessary, and applicable, alternative strategies will be developed. The FDOT’s ultimate commitment is removal of the fencing if the deer guard(s) fail to function (i.e., fail to prevent Key deer from gaining access onto US-1).
- Long-term maintenance of the Key deer travel corridor parallel to the fencing will occur, including the removal of exotic vegetation.
- Commitment of staff and funding occurred in 1999 for preparation of a Habitat Conservation Plan (HCP) for Big Pine Key. This plan, which came about as an outgrowth of the crossing project, will be sent to FWS in mid-2003 for review.

6. 6. What measures of success have been used to determine overall effectiveness of the project/program/initiative in meeting environmental stewardship goals. If the

project/program/initiative has not yet been implemented, what measures will be used to determine such effectiveness?

The measure of success used to determine the overall effectiveness of the project ultimately would be a reduction in Key deer mortality. With implementation of the wildlife crossing project, the FWS anticipates Key deer mortality to decrease by 10-13 per year within the project segment. As committed to FWS, the FDOT has funded a two-year, **post-construction monitoring research** project. The purpose of this ongoing research is to evaluate utilization of the crossing system by Key deer as well as effectiveness of the deer guards. This research (conducted by Texas A&M University) includes the use of radio-collars, GPS collars, and infrared-triggered cameras, in order to provide information from marked Key deer. The objectives are to compare survival/mortality, movement, and dispersal of Key deer, both pre- and post-construction for the project segment.

In addition, the FDOT committed to FWS to modify or remove the deer guards/fencing if there was a failure of the system to achieve the desired results. Thus far (although completed only 3 months), the project has been proclaimed a success by FWS, in that no deer roadkills have occurred along the segment of US-1 where the crossing system exists. By involving FWS at all stages of project development, the FDOT increased its credibility as an environmental steward (i.e., not a solely engineering entity). The project resulted in improved trust and a strengthened relationship between FDOT and FWS (and other regulatory agencies).

This project reinforces FDOT's achievement in addressing the problem of wildlife mortality on roadways throughout the State. The FDOT has demonstrated an agency-wide commitment to stewardship in this area of environmental concern. In fact, the FDOT is recognized as a national leader in this area of environmental stewardship.

7. 7. Describe why you believe your project/program/initiative represents "best practice" and should be recognized with a national award.

Although many wildlife crossing projects have been implemented throughout the country, this project was unique in that it was designed for a species found only in the lower Florida Keys. Although every aspect of the project was based on the expertise of Key deer biologists, there was no precedent project elsewhere and thus the probability of success was somewhat uncertain. However, this did not deter the FDOT, as it used collaboration and best science to keep moving forward with the project. The design process was flexible, allowing critical elements to be modified or refined (e.g., type and location of crossings, deer guard grid size, etc.). Information pertaining to the deer guard design has been requested by other states that are interested in its possible application to their needs.

What best illustrates the unique nature of this project is that the environmental needs led the project, and that aspects of traditional engineering had to be adjusted in order to accomplish these needs. There was no truly defined engineering goal at the start of the project - only an environmental goal that the FDOT had to find a way to achieve through engineering design.

The application must be signed by the Chief Executive Officer of the DOT or his or her designee.

Jose Abreu, P.E.
Secretary, Florida Department of Transportation

Date