VTRC
Virginia Transportation Research Council

We bring innovation to transportation.

Animal-Vehicle Collision Research and Mitigation

I-64 Charlottesville-Waynesboro

Bridget Donaldson

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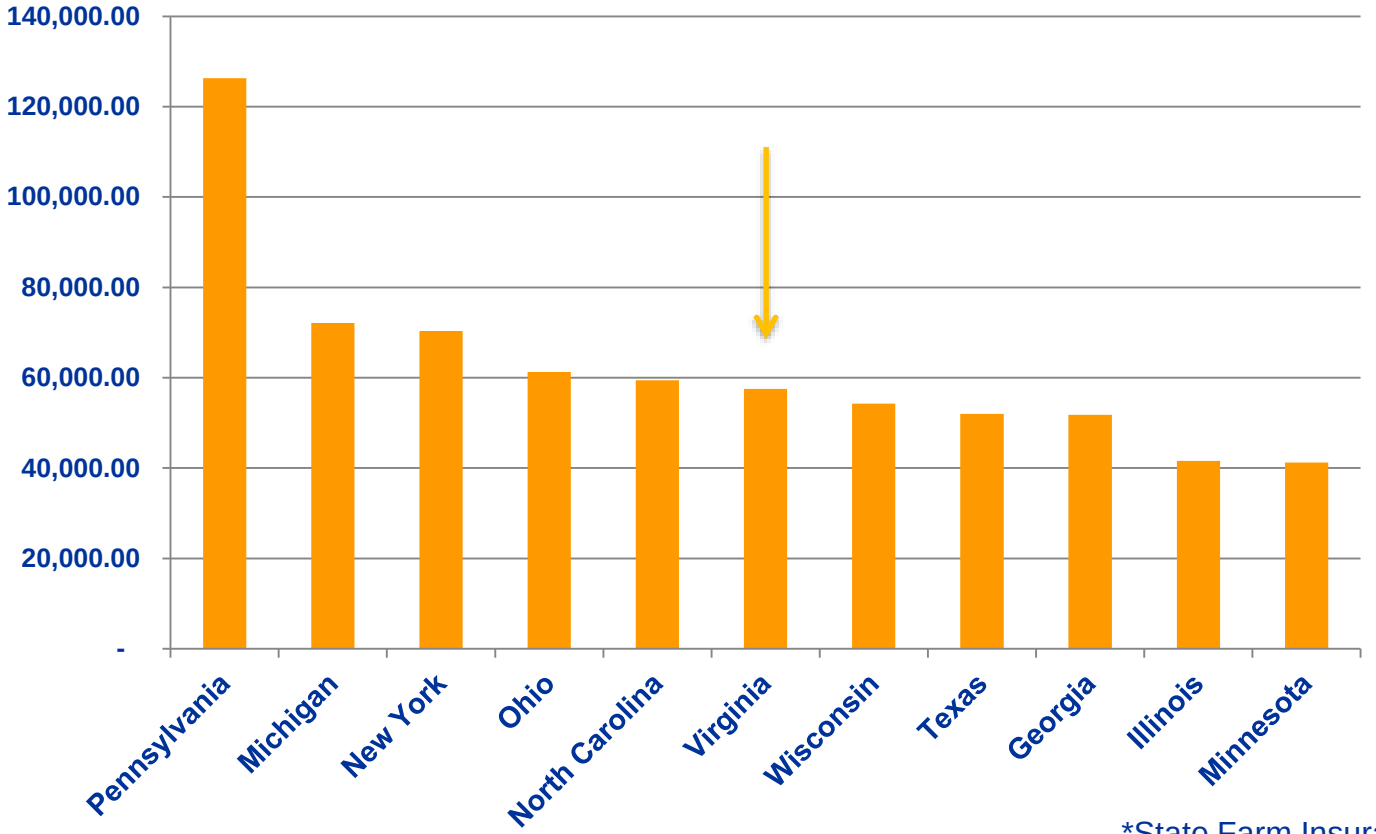
Virginia Transportation Research Council

States with Most Deer-Vehicle Collisions

(July 2014 - June 2015)*

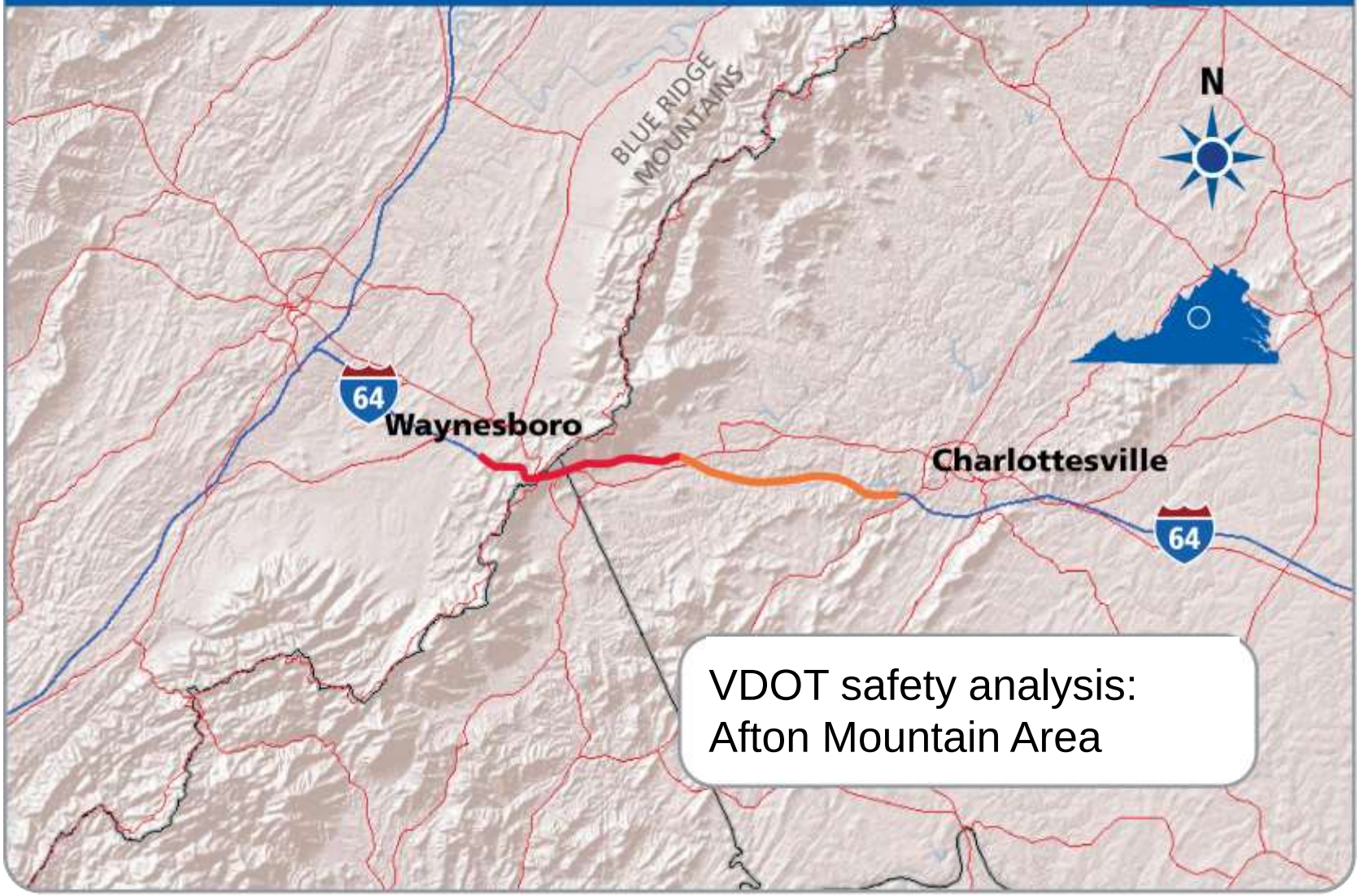


*State Farm Insurance projections for the entire insurance industry. Includes *deer, elk, and moose*

1.25 million DVCs in the U.S.

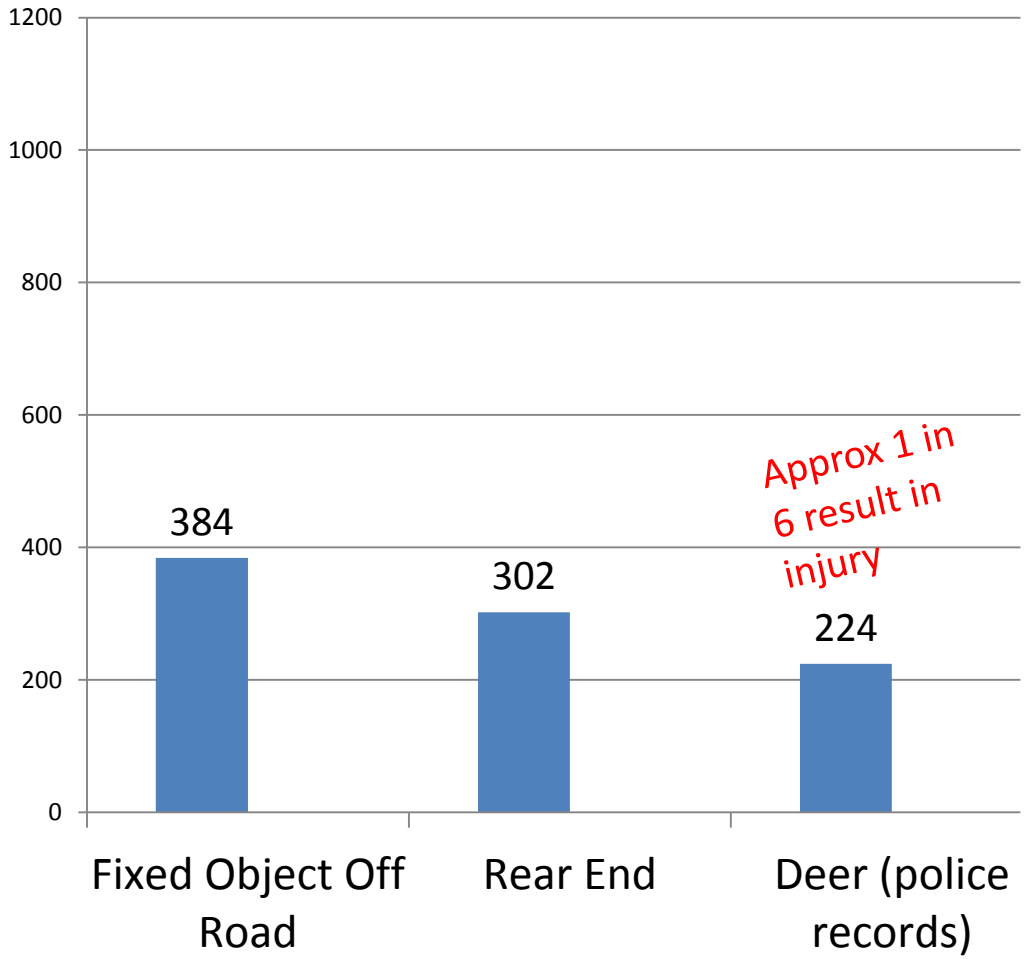
VDOT spends ~ $4.1 million/year on carcass management

I-64 Safety Improvement Area: MM 97 – 105



VDOT safety analysis:
Afton Mountain Area

Collision Types
Staunton to Charlottesville, I-64 MM 87-118 (2012-2016)



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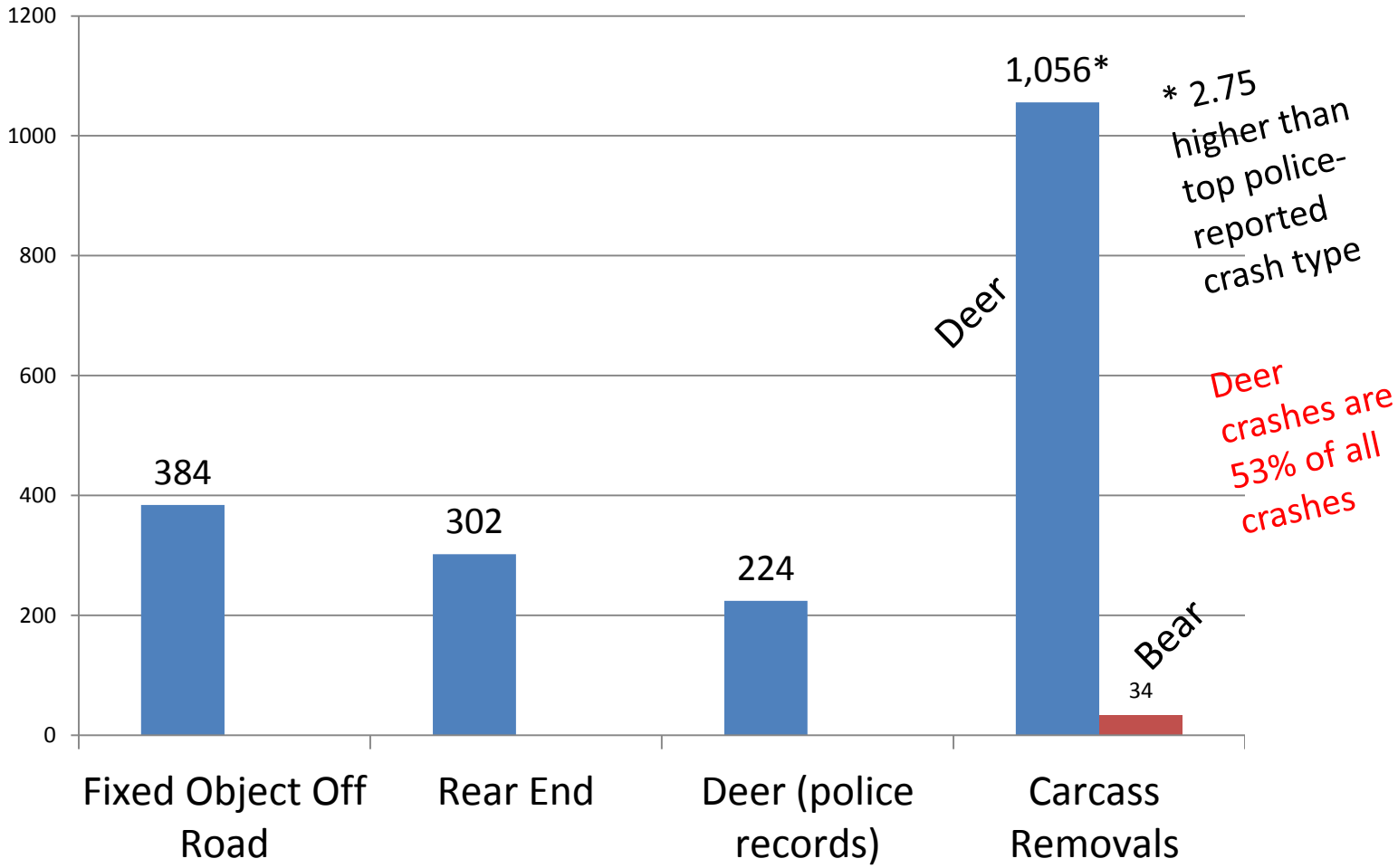
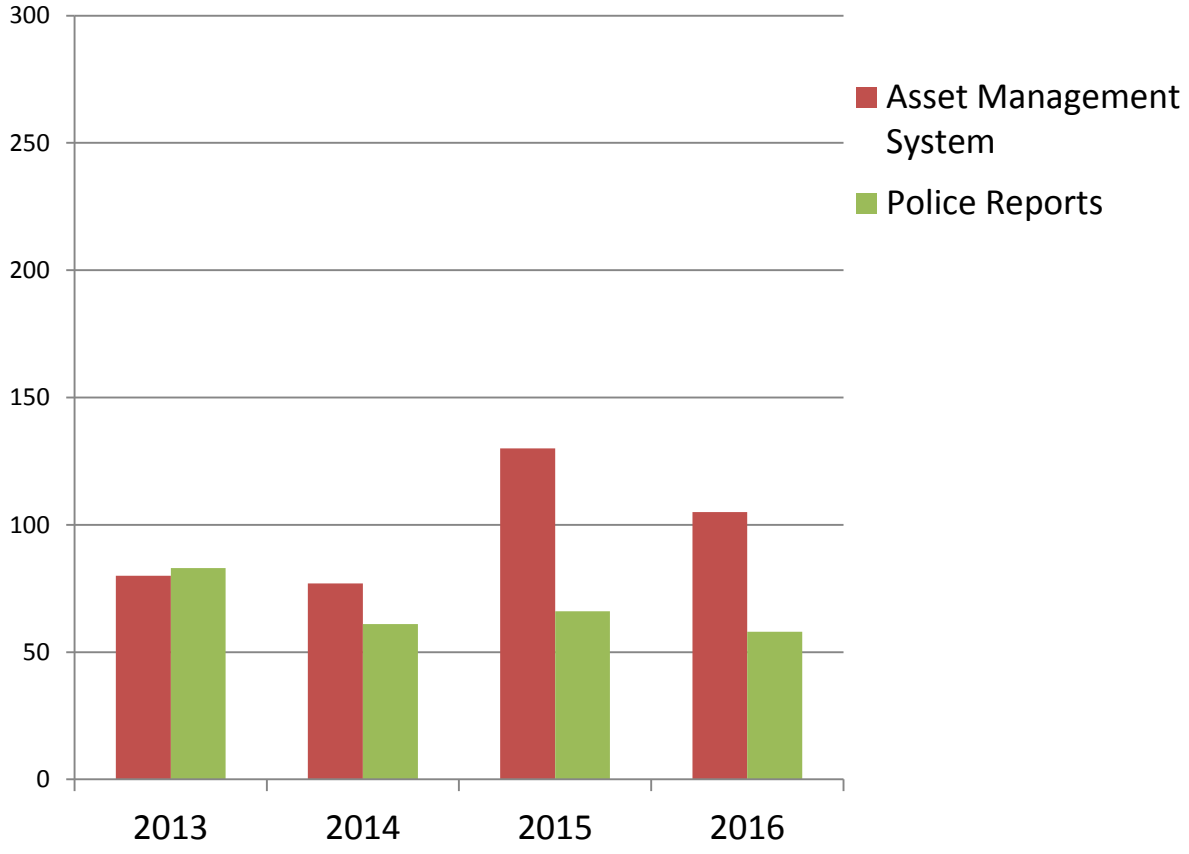
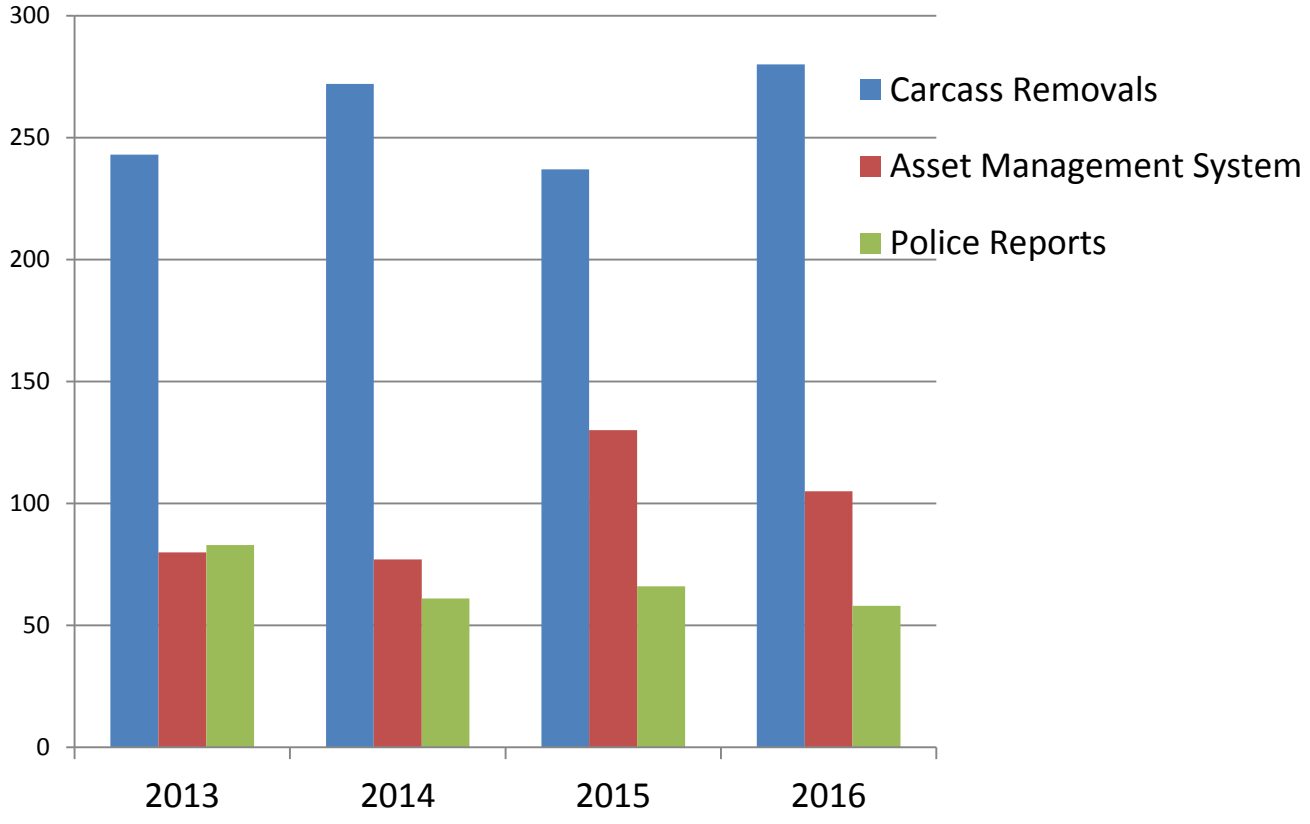


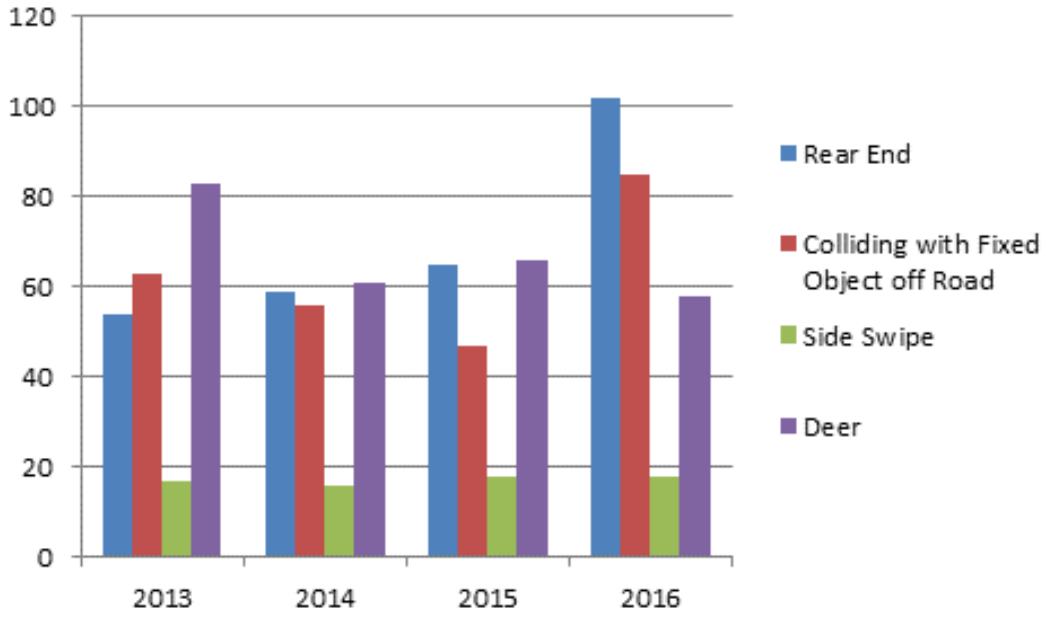
Deer Crash Data
I-64 in Albemarle County (MM 102 -131).



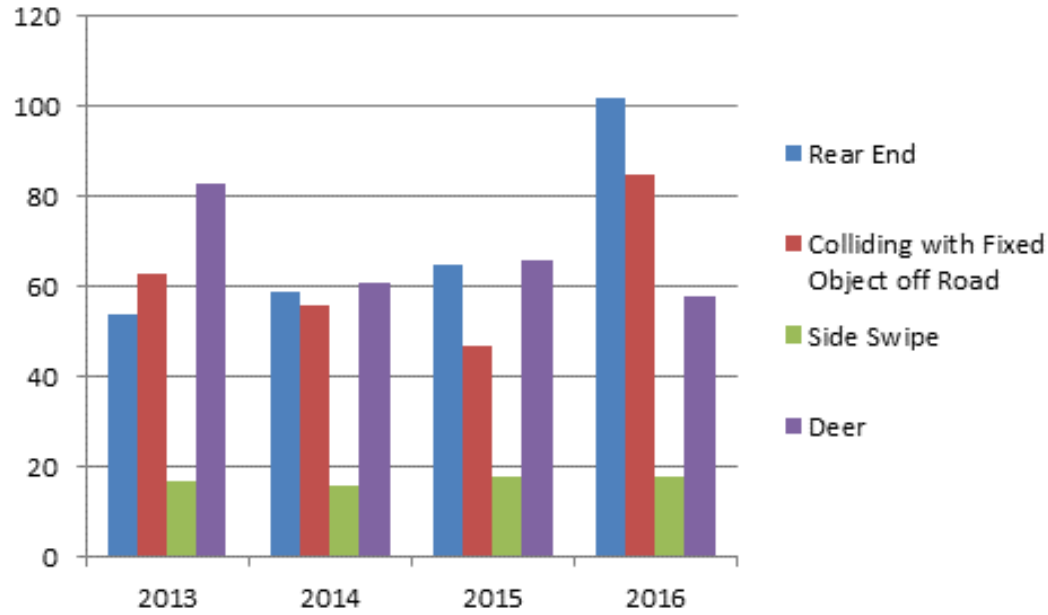
Deer Crash Data with Carcass Removals
I-64 in Albemarle County (MM 102 -131).

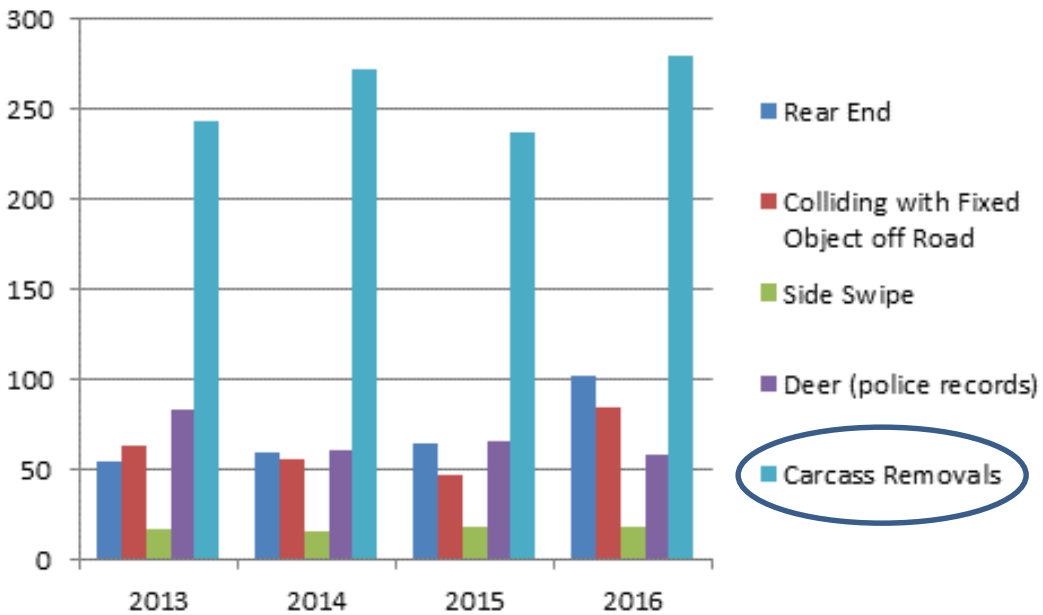


Collision Types, I-64 in Albemarle County



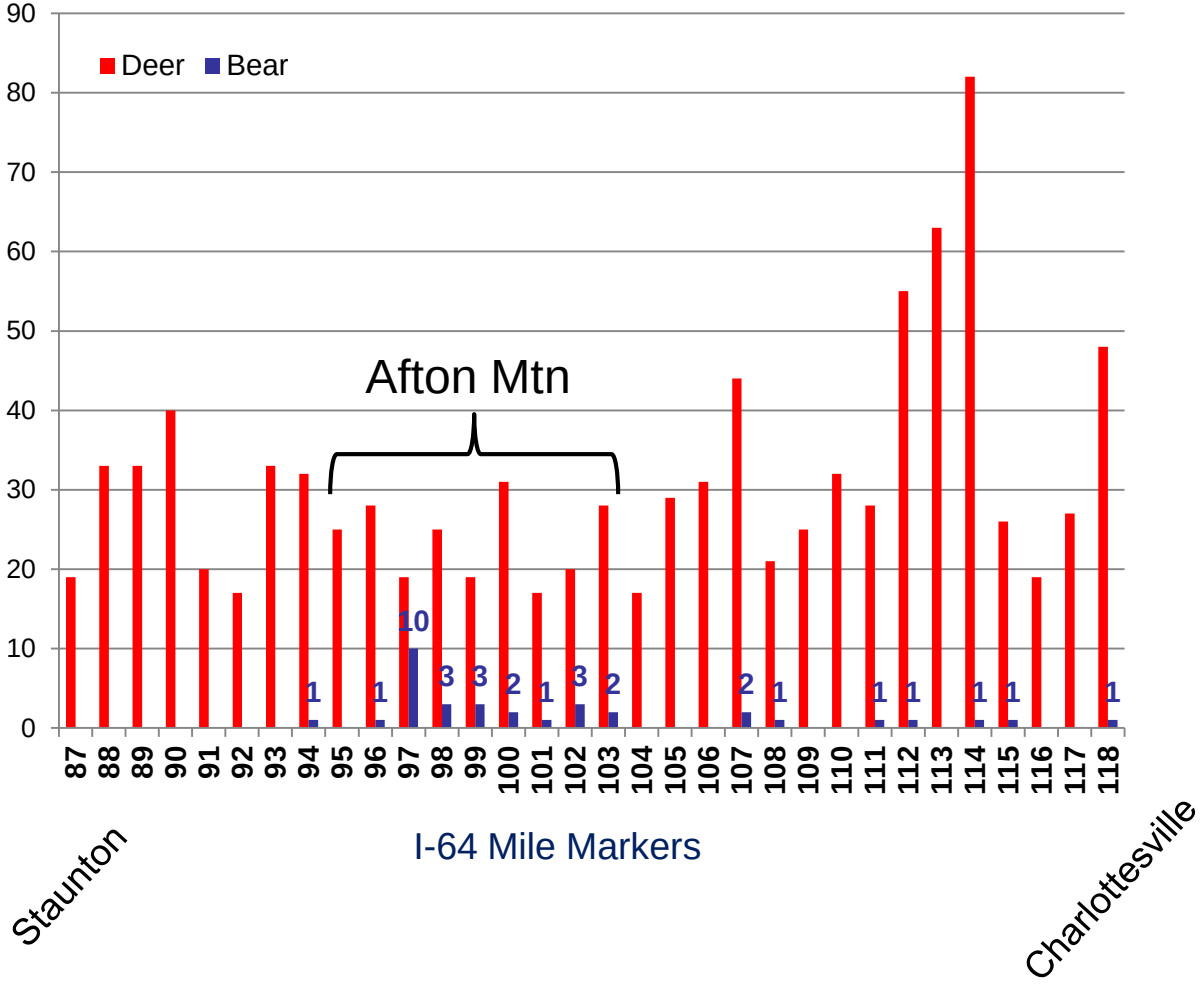
Collision Types, I-64 in Albemarle County



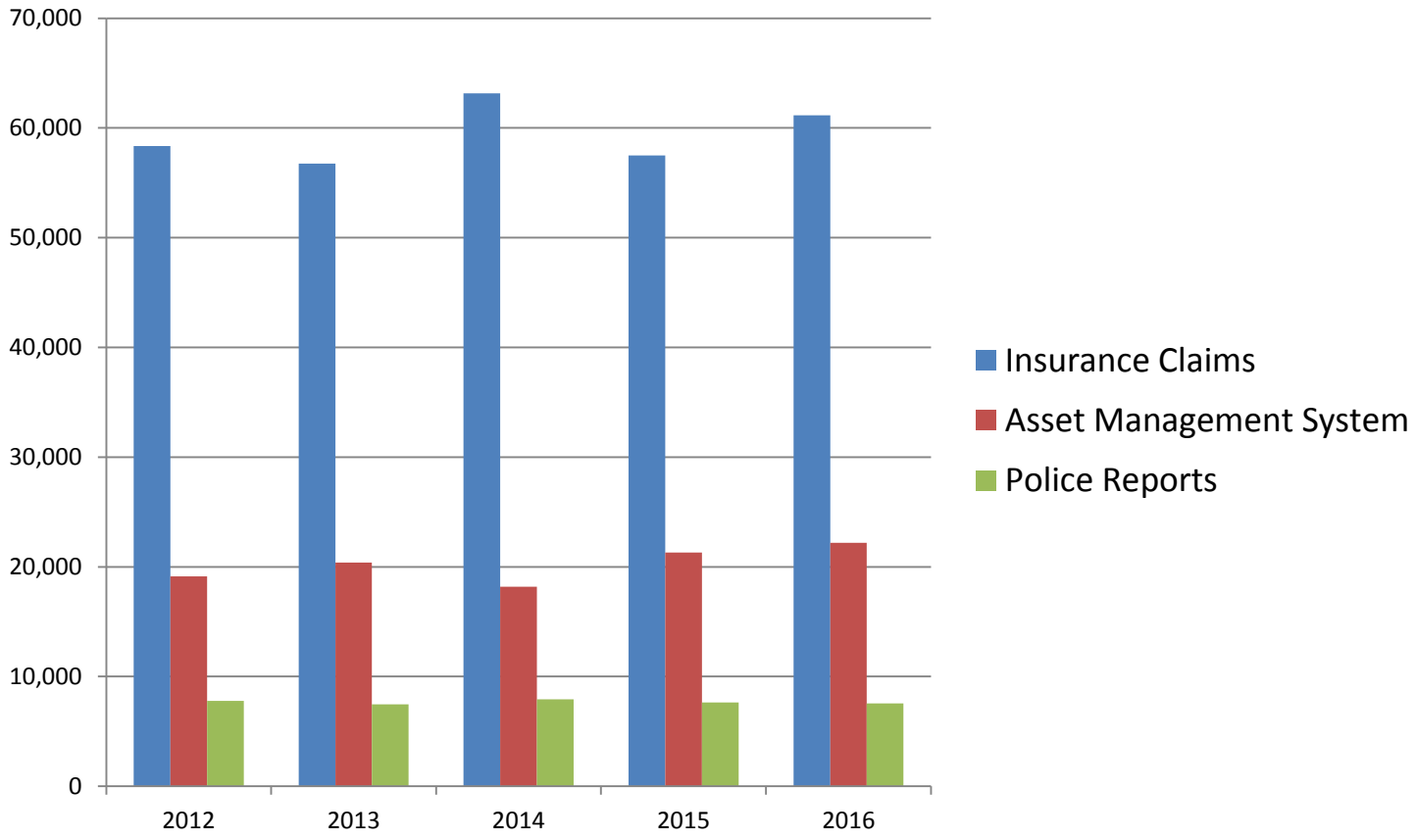


*Working on means to collect carcass removal data statewide

Deer and Bear Carcasses (1 mi segments) 2012-2016

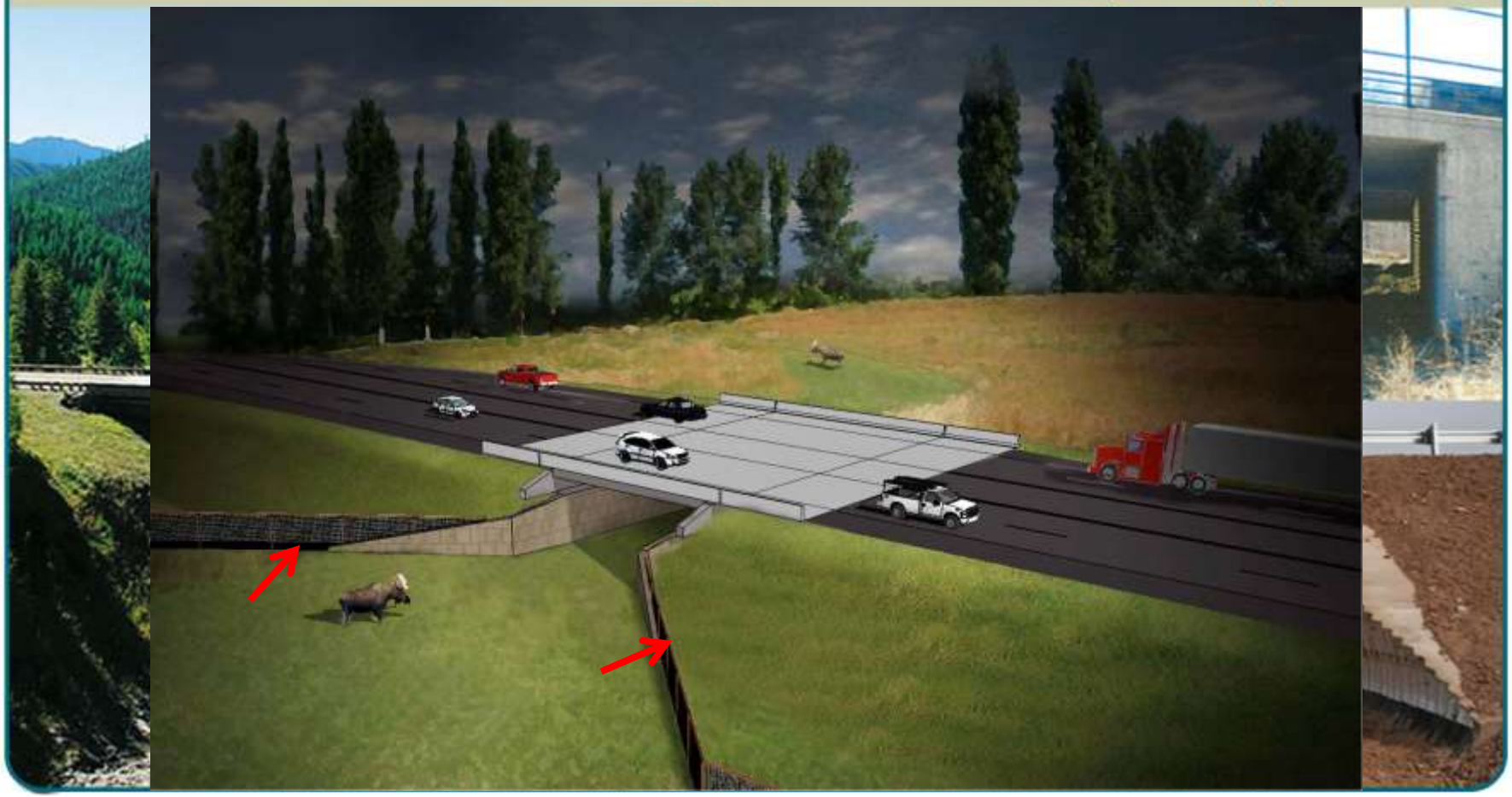


Virginia Deer Crash Data (2012 – 2016)



Effective Mitigation

Underpasses/overpasses with fencing: 86% DVC reduction



Study Background

- The U.S. road system includes more than 582,000 bridges longer than 20 feet, 480,000 of which are over waterways.*

- The road system also includes millions of smaller structures, many of which serve as passageways for wildlife.*

- Because these structures were not designed for wildlife passage, they have no fencing.

Research is needed to establish how retrofitting an *individual* existing underpass with fencing affects AVCs and the use of the structure.

First, data is needed to support fencing recommendations

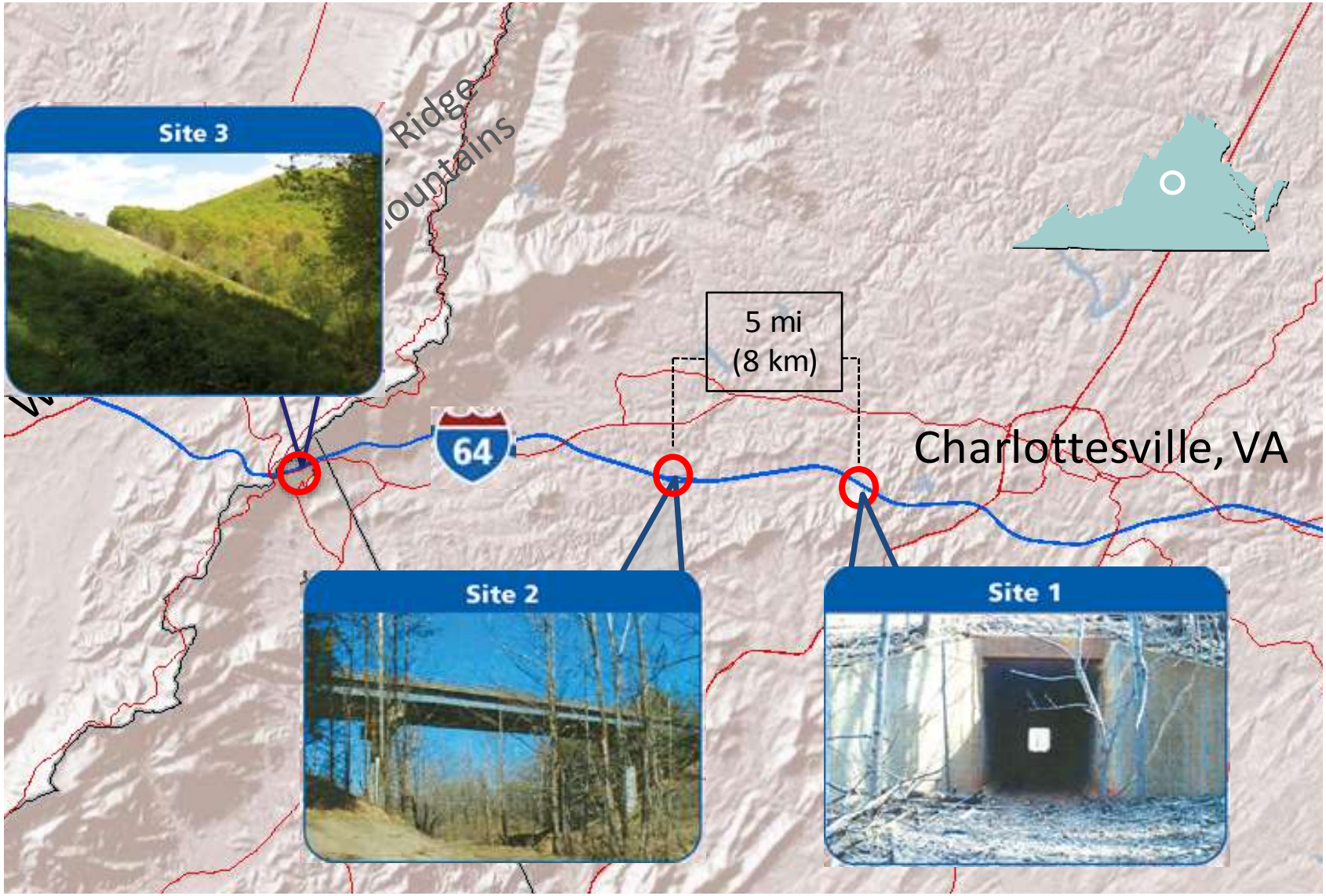
*Forman et al., 2003

Purpose of Study

Evaluate activity and behavior of white-tailed deer and other wildlife along

(1) unfenced isolated underpasses and

(2) a forested riparian corridor with no viable underpasses



307 ft span

10 x 12 ft openings
189 ft long

Methods

- Collect carcass removal data (2012-present)

Date	Mile Marker	Animal Desc.
10-1-14	94 WB	Racoon
10-2-14	~~Deer~~ 90.9 WB	Deer
10-2-14	~~Racoon~~ 163.3 EB	Racoon
10-6-14	135.7 WB	Deer
10-6-14	135.5 WB	Deer
10-6-14	122.8 WB	Deer
10-6-14	117 WB	Deer
10-6-14	116.9 WB	Deer
10-6-14	110.8 WB	Deer
10-6-14	11[illegible] WB	Deer
10-6-14	99.5 WB	Deer
10-6-14	128.2 EB	Deer
10-6-14	163 EB	Deer
10-7-14	154.3 EB	Possum
10-6-14	114 EB	Deer
10-7-14	158.9 EB	Deer
10-7-14	100.7 EB	Deer
10-8-14	~~[illegible]~~ 107 WB	Deer

- Monitor study sites with cameras

Camera Monitoring (2 yrs)

52 cameras deployed March 2013

Camera Monitoring

Primary questions:

Underpasses

- Wildlife use of the underpasses (full crossings vs turning back)
- Activity and behavior along the adjacent roadside
- Roadside activity relative to distance from the underpass

Drainage Corridor with no underpass

- Activity and behavior of wildlife at drainage/interstate intersection compared to farther away from intersection


Site 2
16 cameras
64
MM
110
64
MM
111
Camera
Arrow indicates direction
0.5 mile


Site 3
Forested
Riparian
Corridor
Rock wall
Rock wall

RESULTS

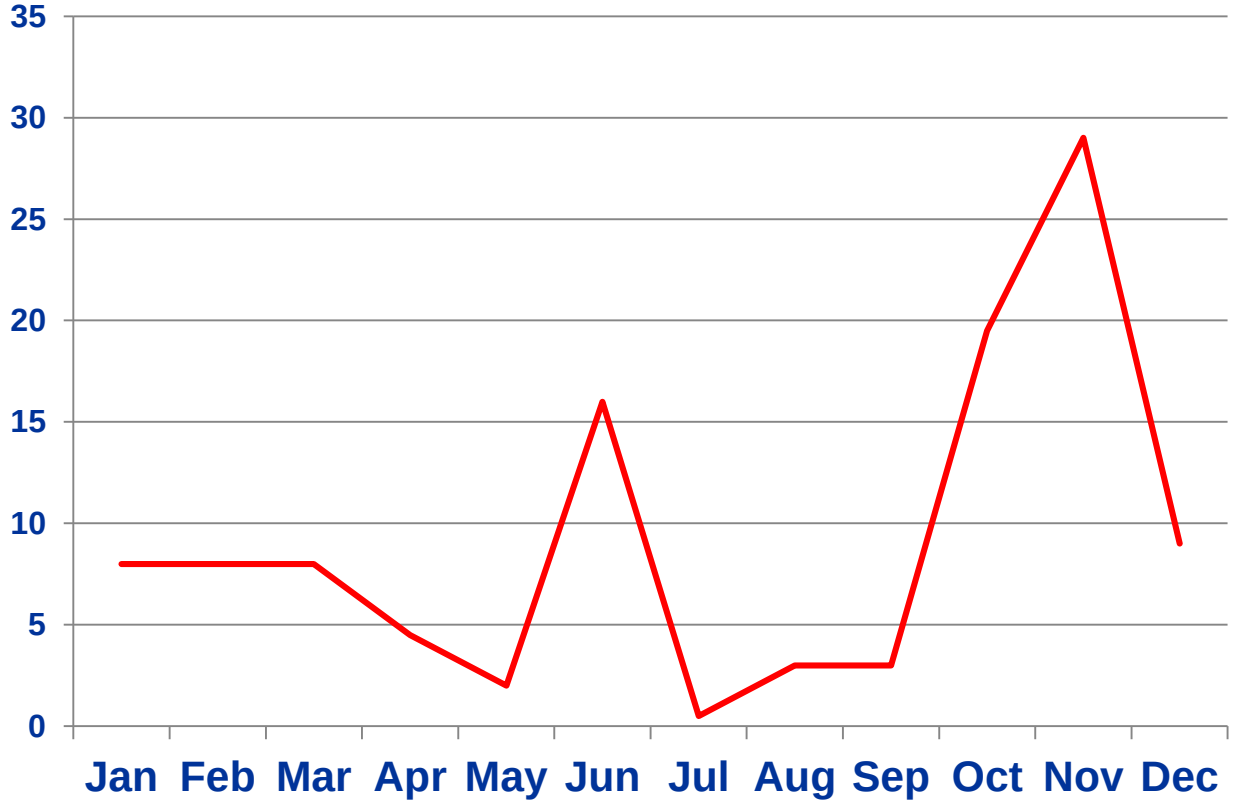
Deer and Bear Carcasses 2013-2014

9.2 DVCs per mile per year

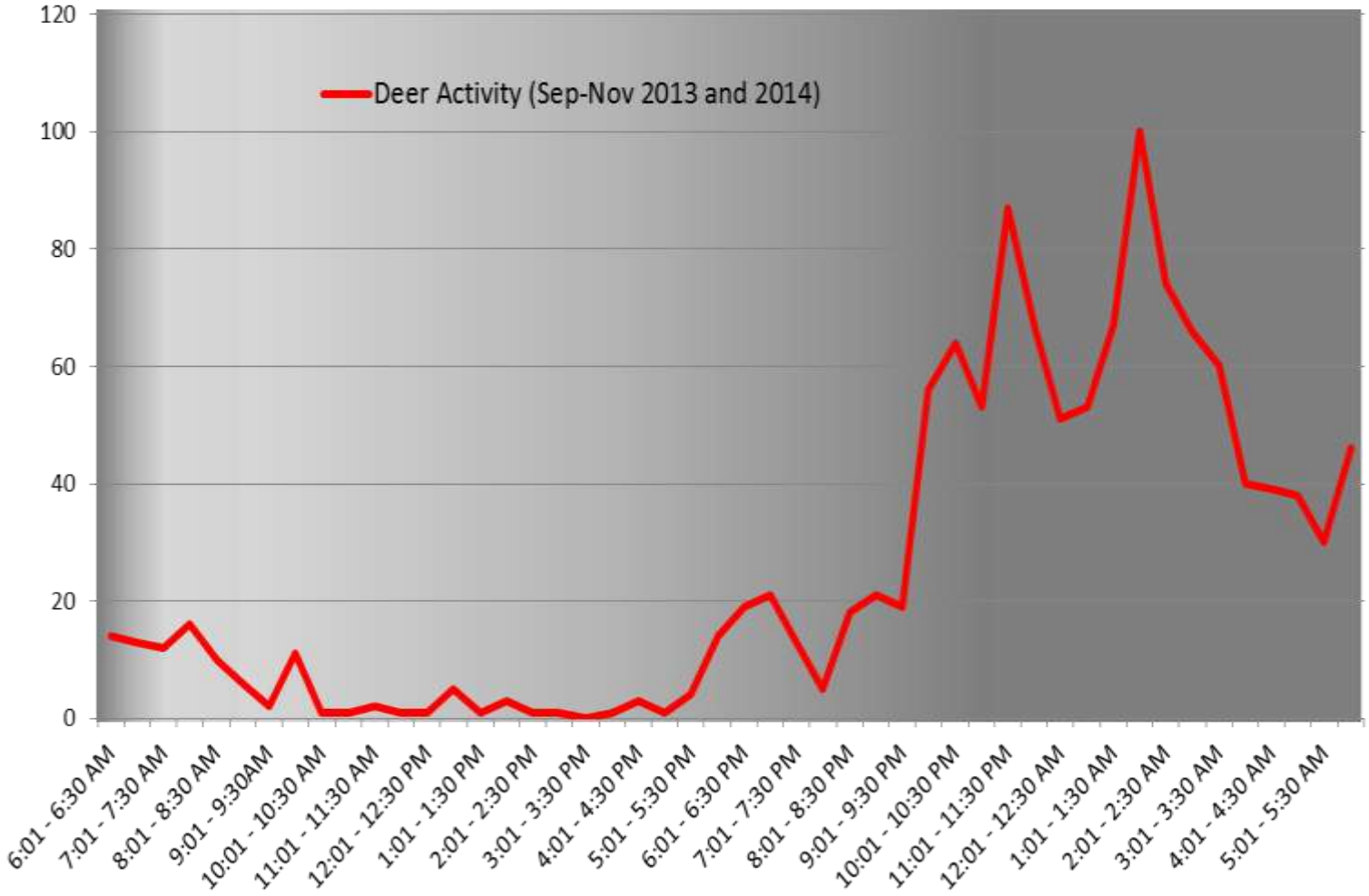
Bear: 18 bear deaths (2 yrs)

RESULTS

Deer Carcasses per Month



Deer Activity by Time of Day (Sep to Nov)



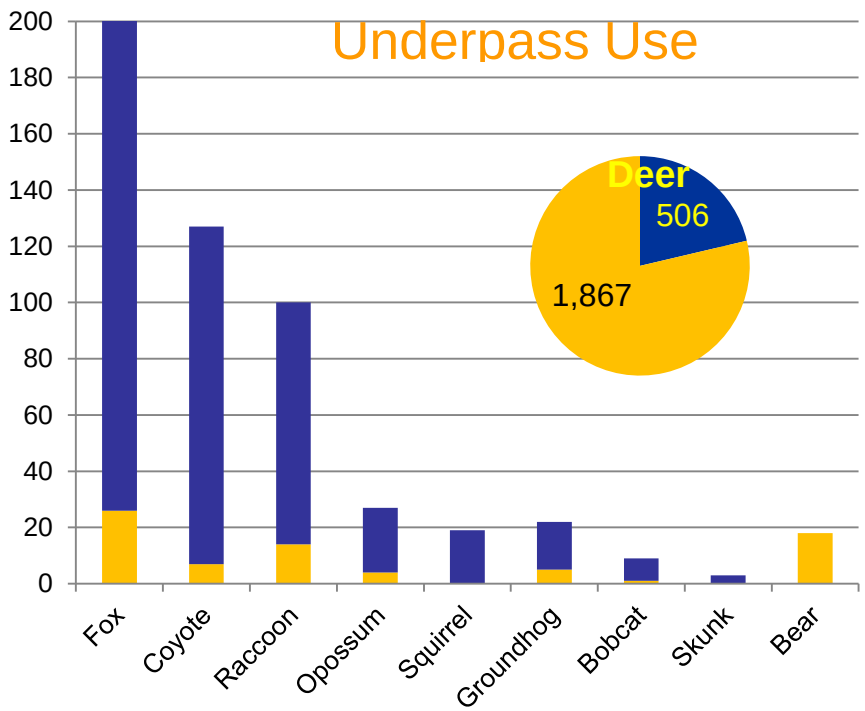
PHOTOS

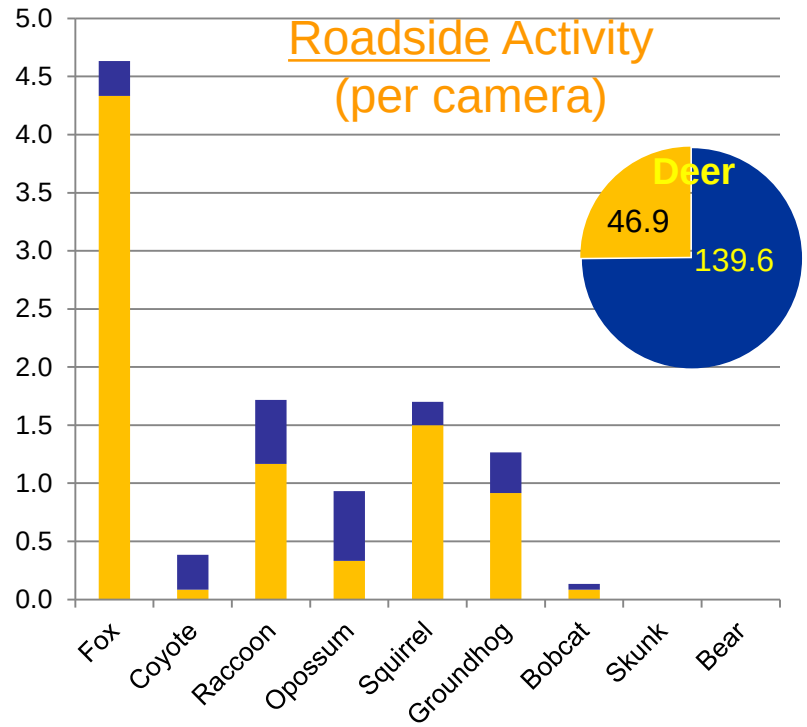
336,000 total

- ~ 1/3 deer
- 35 black bears
- Few thousand photos of other species

Wildlife Activity

Site 1 vs Site 2 (2 yrs)



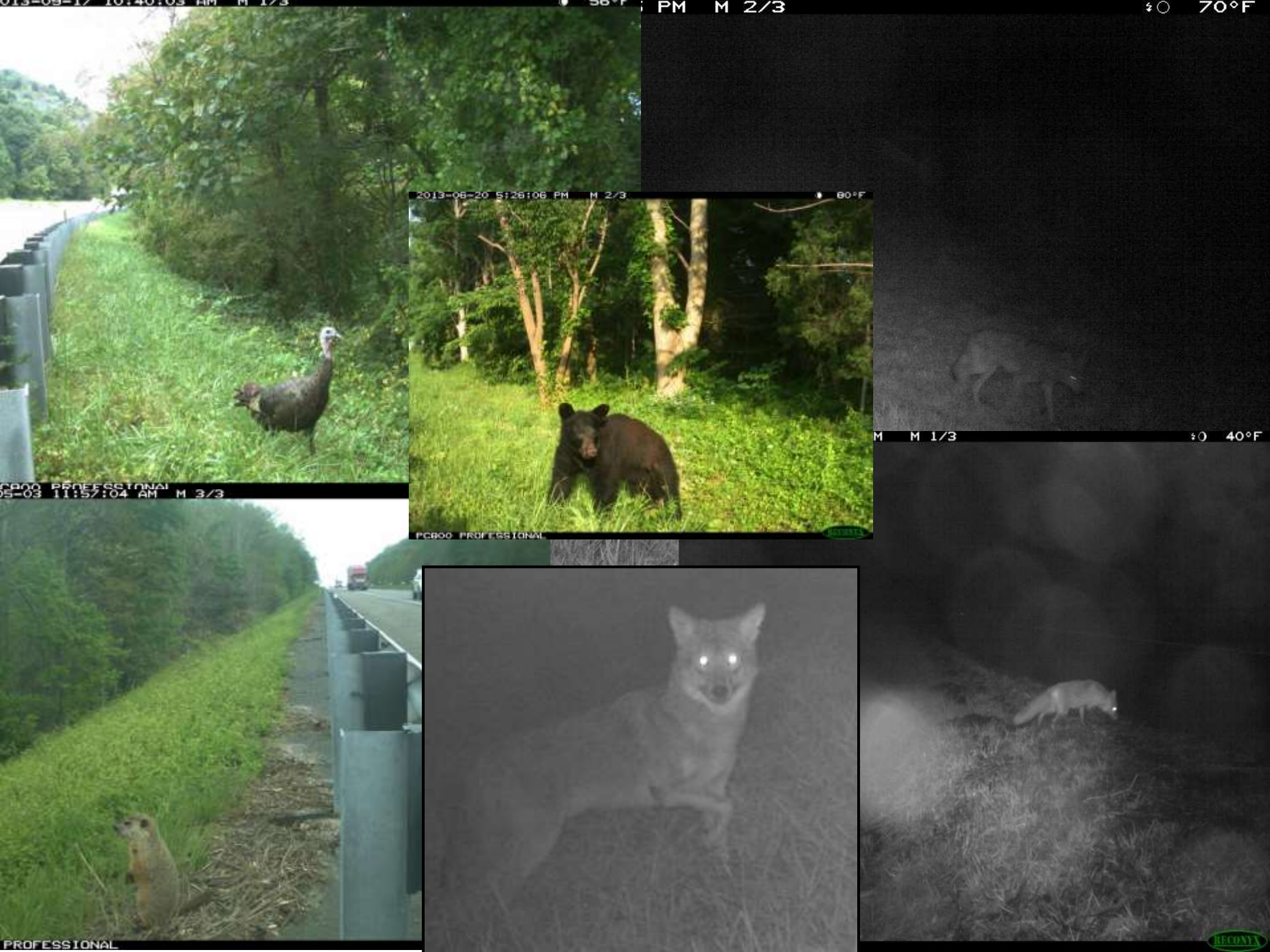


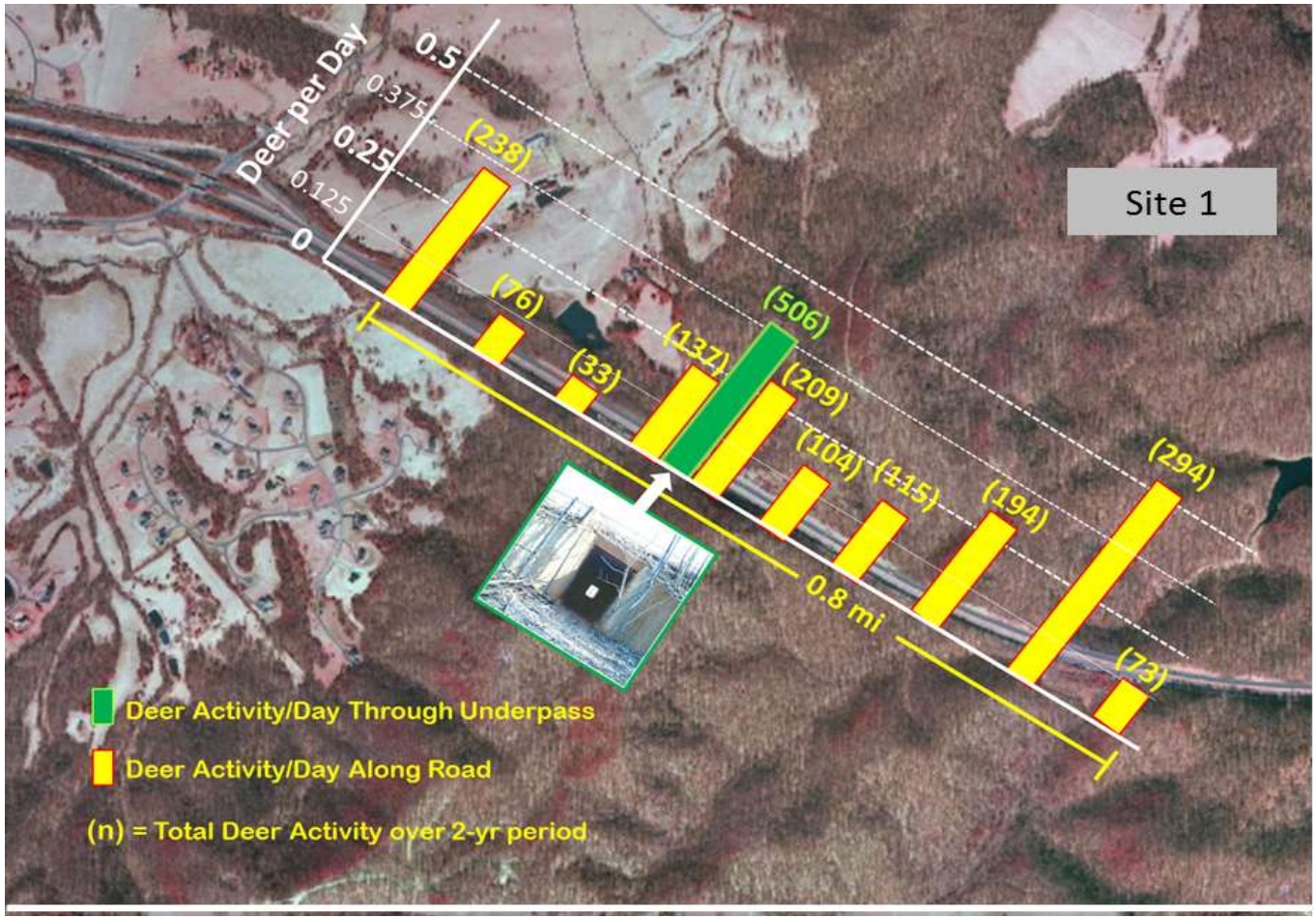
Site 1 culvert

Site 2 bridge

Site 1 roadside

Site 2 roadside


PM M 2/3
70°F
2013-06-20 5:28:06 PM M 2/3
80°F
PCAOO PROFESSIONAL
M M 1/3
40°F
PCAOO PROFESSIONAL
M 3/3
PROFESSIONAL



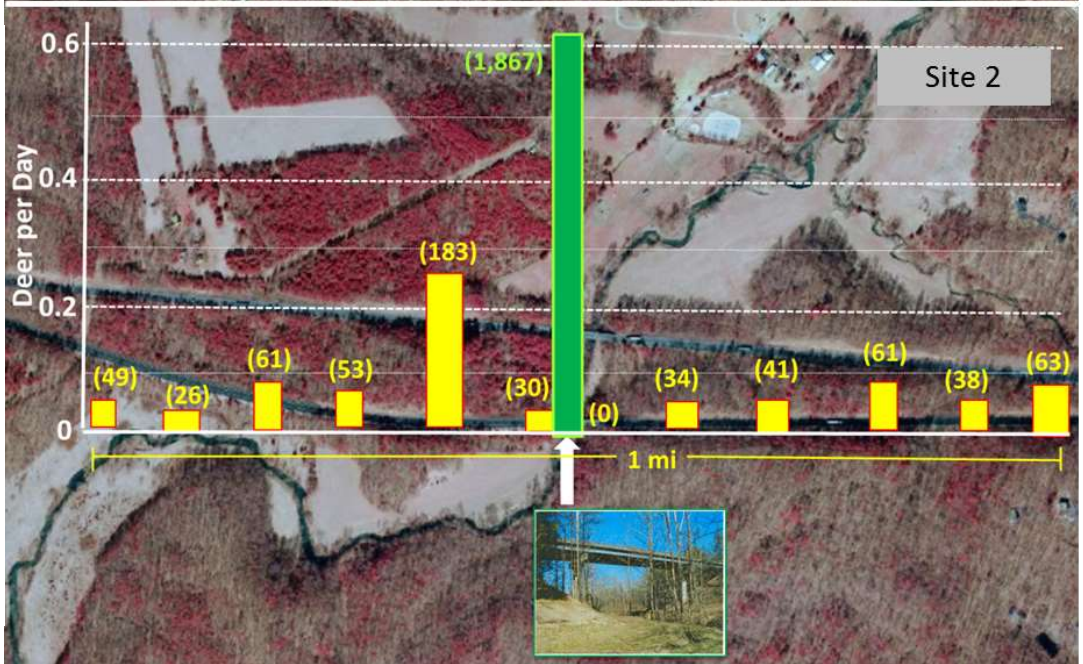
Site 1 Deer Activity: 1,152 per yr

Deer activity along the roadside adjacent to the culvert was 3 times greater than activity through the underpass

Site 1 Deer Activity: 1,115 per yr

Site 1 Deer Activity:
1,115 per yr

Site 2 Deer Activity:
1,253 per yr
Roadside deer activity was 3 times *less* than activity through the underpass

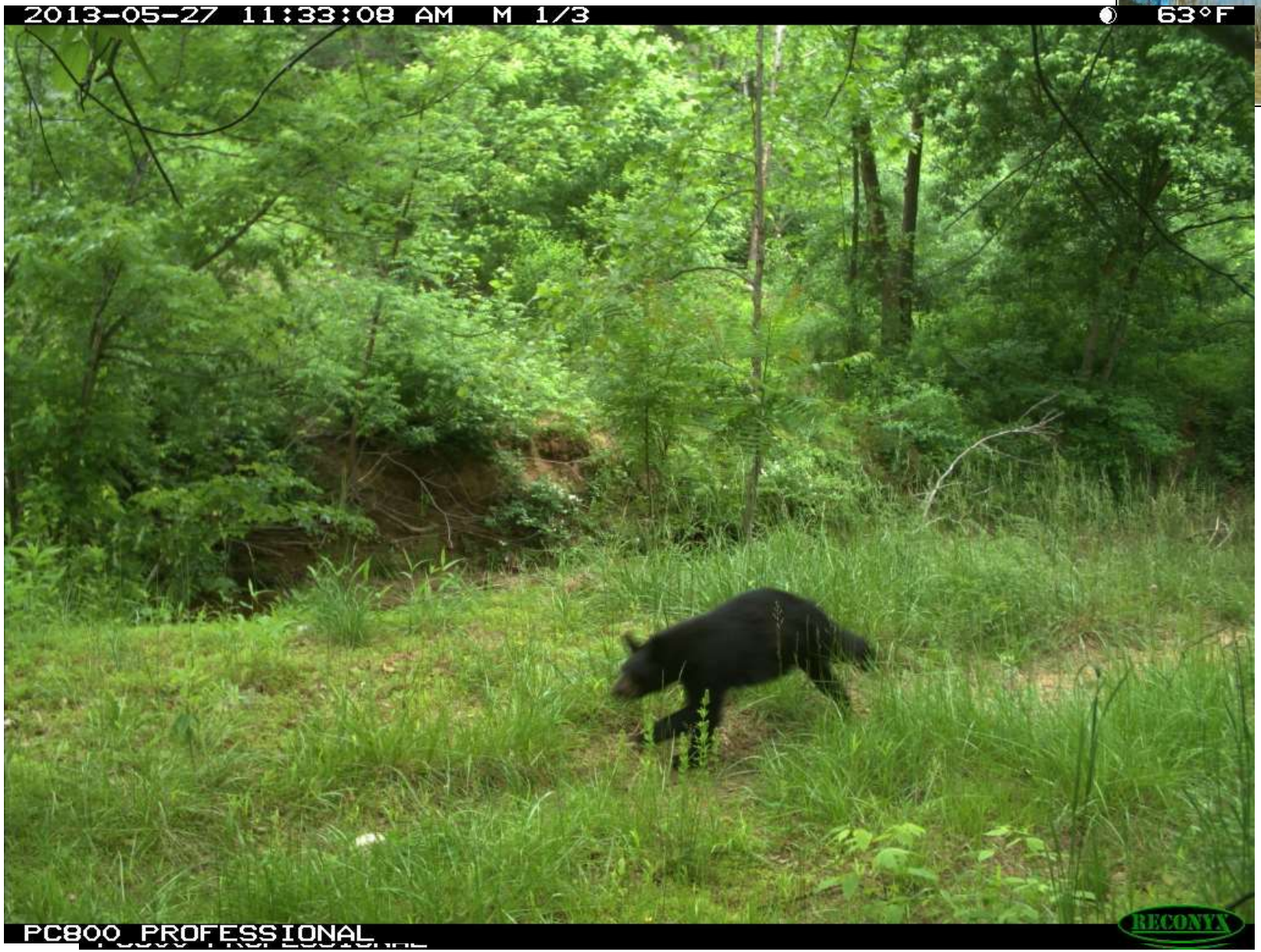


DVCs at each site:
7.5/mi/yr

Site One


2013-03-13 10:59:07 AM M 2/3
48°F
2013-03-16 9:01:49 PM M 1/3
53°F
2010
PC800 PROFESSIONAL
RECONYX
PC800 PROFESSIONAL
RECONYX

Site Two



Roadside


2013-04-06 11:57:38 PM M 3/3
46°F
PC800 PROFESSIONAL


2014-10-18 6:21:29 AM M 3/3
57°F
PC800 PROFESSIONAL

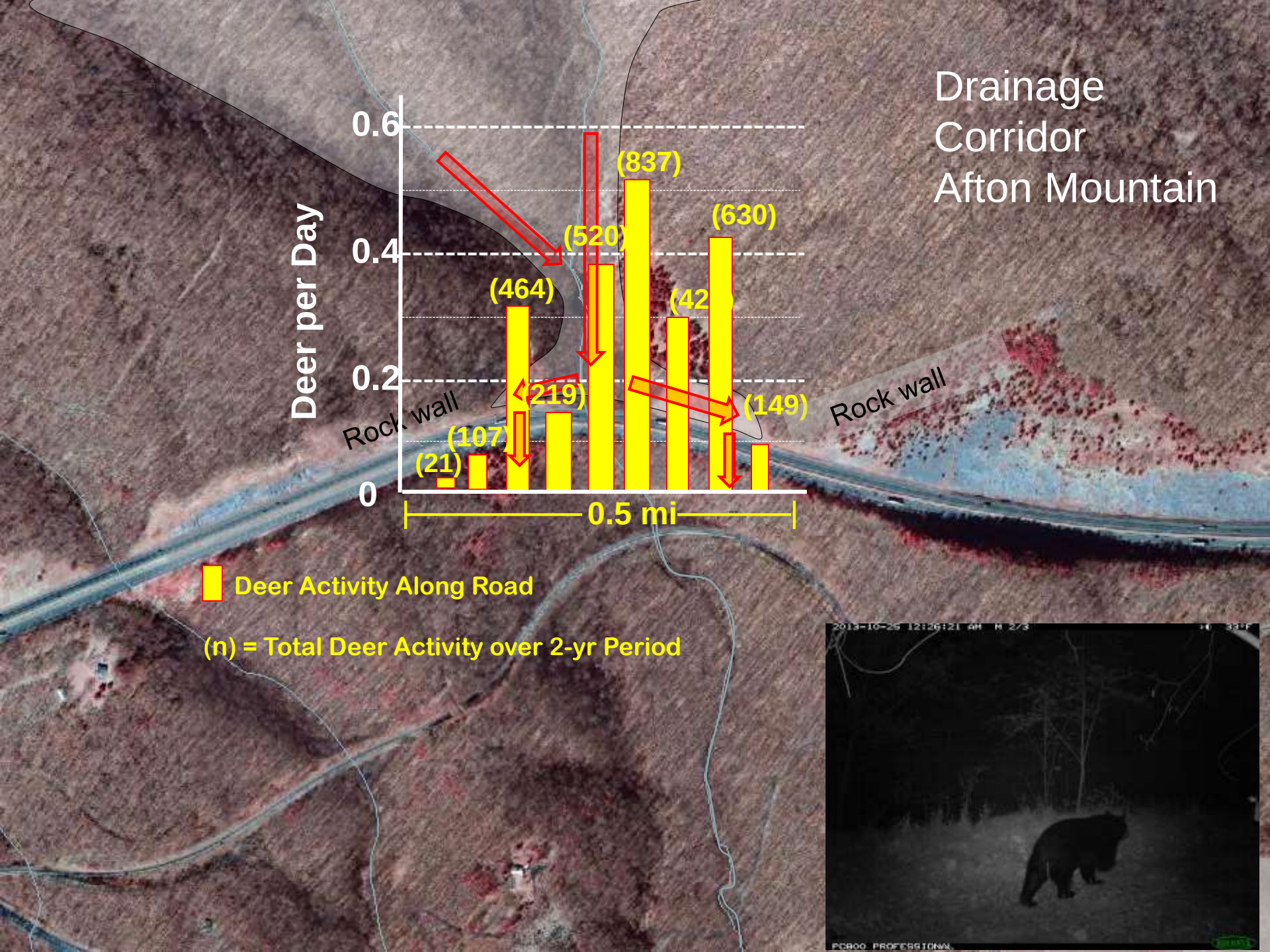

PC800 PROFESSIONAL


2013-04-06 11:57:43 PM M 1/3
46°F
PC800 PROFESSIONAL


2013-06-24 11:53:58 AM M 1/3
99°F
PC800 PROFESSIONAL

Roadside Behavior

Drainage Corridor Afton Mountain




2014-05-05 7:03:15 PM M 3/3 54°F
PC800 PROFESSIONAL
RECONYX

Cost Savings

Fencing and escape structures for just <u>one</u> underpass is expected to result in a savings in costs associated with deer-vehicle collisions of **$501,473** over its service life

Assuming $6,617 per DVC (Huijser, 2009)

Fencings is cost effective when it prevents **1 DVC** per mile per year

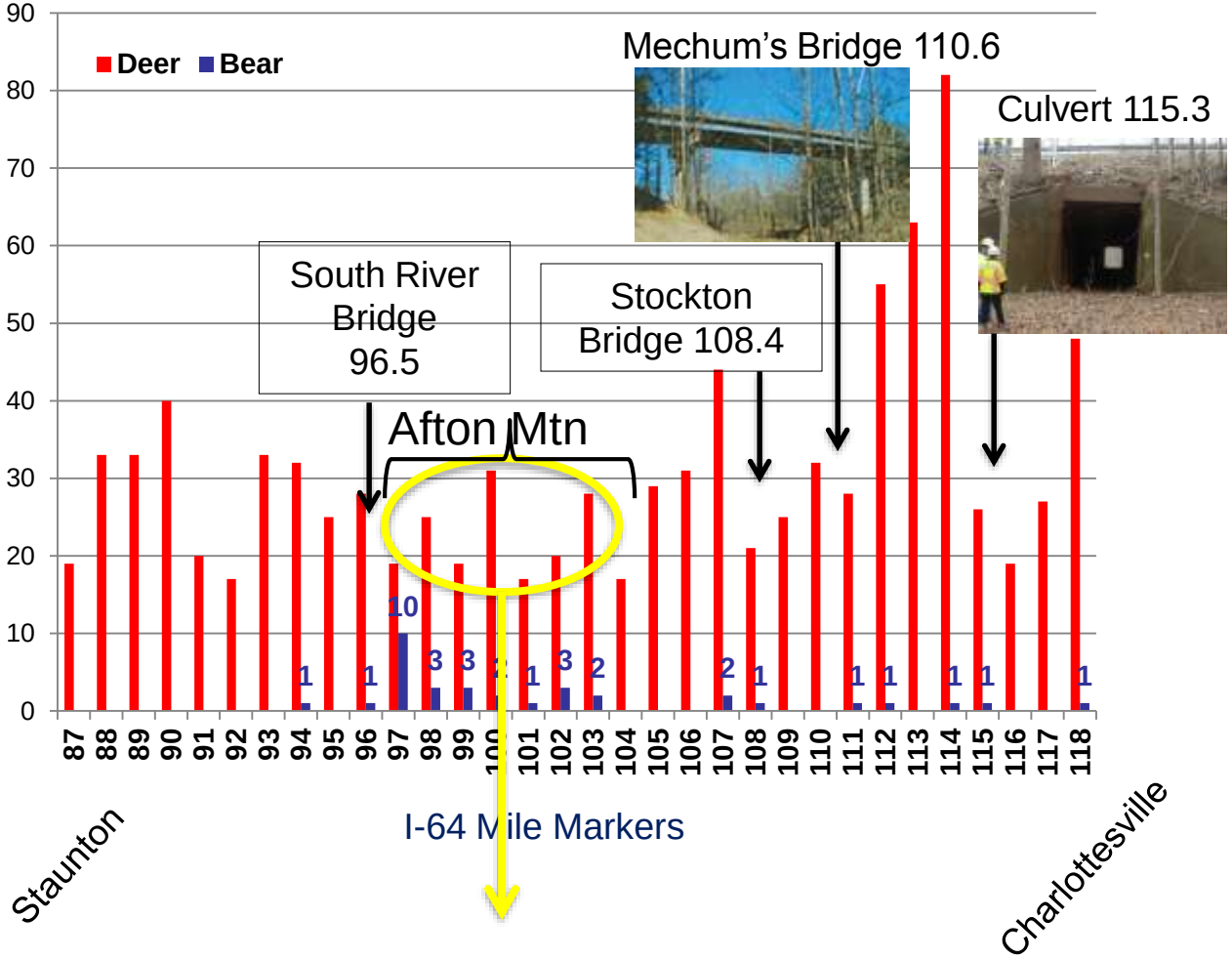
Implementation

Fencing installation at 2 underpasses Feb-June 2017

Implementation

- deer warning messages on changeable message signs, Oct and Nov 5pm to 9am (Crozet to Afton Mountain)

Opportunities?



Potential Target for Virginia Road Ecology Working Group (FWS, DGIF, DCR, conserv groups)

Funding Opportunities for Wildlife Crossings

- Highway Safety Improvement Program
- Transportation Enhancements program (FAST ACT) – funds habitat connectivity projects
- Assoc of Fish and Wildlife Agencies
- VDOT's Research Implementation funds
- Grants
- Foundations
- Private Donations
- Local Taxes

Thank you

Technical Review Panel
Vernon Hoke (Project Champion)
David Morris
Amy O'Leary
Nelson Lafon (VDGIF)

Camera Pole Installation
Danny Huffer
Gary Wheeler

Field/Research Assistance
Lewis Lloyd
Michael Crawley
Olivia Daniszewski
Lark Washington

Site Visits
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David Morris
VJ Kulkarni
Braden Chapmen
Bill Jones
Darrel Hayes
Nelson Lafon
Jim Bowman
David Kocka
Al Bourgeois
Mike Pelton

Implementation of Recommendations
Dean Gustafson
Matthew Shiley
Sharad Uprety
David Pearce
Jimmy White

Report available
http://vtrc.virginiadot.org Report *16-R4*
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